Railway Age

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Why Stop Laws Should Be Enacted

AS the number of grade crossing accidents continues to increase a corresponding increase is noted in the number of accidents in which automobiles run into trains passing over or standing on highway or street crossings. On some railroads there have been nearly as many occurrences of this type of accident as of cases in which the locomotive has been in direct collision with the motor vehicle, emphasizing the need of laws requiring all automobiles to stop at railroad crossings. Recently at a railroad and highway intersection on the Denver & Rio Grande Western an automobile was driven into the side of a slowly moving freight train. While the train crew were moving the damaged car from the crossing another automobile was driven into the opposite side of the train. The motorist prepares himself for almost any movement on the part of an approaching vehicle at a street intersection, but he seemingly drops all care when he comes to a railroad track where a train can be manoeuvred out of his way about as easily as a brick wall. It is safe to assume that the crossing involved in the accident referred to was as well lighted at the time of the accident, 9:00 p. m., as many isolated street intersections. Stop laws are needed not so much to protect the railroad, for most accident reports show little damage to railway equipment, as to save the lives of the motoring public.

Modernization of Coach Interiors

TO a steam railway man, one of the most lasting impressions of the exhibit of car equipment at the American Electric Railway Association convention at Cleveland in October was that of the great improvement which some of the electric railways have made in the comfort and beauty of their cars. Individual chairs in various kinds of upholstery and with deep cushioned seats and backs, paneled ceilings and walls and other similar appointments were much in evidence. The credit for this improvement of car interiors must be accorded the motor bus. It pioneered along these lines in the development of so-called parlor buses. The popularity of these buses with the public has indicated plainly to the electric railway operators that the old types of cars with their plain coach seats and meager fittings are not able to meet the competition of the highway carriers. The steam railways are faced with the same situation and they should meet it in the same manner as the electric railways. There is nothing particularly inviting about even the cleanest, newest day coach of what is now standard design. There is something definitely inviting however, about a parlor motor coach with its individual cushioned chair and luxurious appointments. Public patronage accepts just such invitations. Railway coaches can be made as inviting as highway coaches by the use of interior fittings such as make the parlor buses popular. The Baltimore & Ohio has found a most favorable reaction to its operation of a number of day coaches equipped with individual chairs. There is considerable doubt whether any other one thing would go so far to restore the railway coach to popularity. Railways which desire to hold or win back their day coach passenger business are considering carefully all possible means of doing so. The first step might well be the improvement of the interior of their coaches.

Passenger Car Couplers

HAS the last word been said in the improvement of passenger car couplers on American railroads? Can the managements continue to overlook the washroom and club car criticisms after a night run on which it has been necessary to add cars or remake the train one or more times? And what about the people who happen to be in the dining cars when such shifts take place? The train crews try to soften these shocks with the result that the cars frequently fail to couple the first time and one or more attempts are made with greater force. It is not only the passengers who suffer inconvenience. The crews in the congested dining car kitchens are liable to burns or other injuries. Does this not offer a fruitful field for improvement which will relieve the roads of one of the leading causes of criticism on the part of the traveling public? The difficulty has been steadily increasing because of the use of more powerful locomotives and longer trains. Has it not now reached a point where the problem of finding relief must be tackled with renewed energy?

Making the Caboose Safer for Trainmen

COMMENTING on the decline in fatal accidents to trainmen a railroad man of long experience in train service recently observed that, as far as his road was concerned, he believed a large share of the credit was due to higher standards of equipment maintenance. A few years ago, he said, with trains no more than half the size of those now being operated, hot-boxes, pulled-out drawbars, falling brake-beams and similar mishaps were twice as frequent as now. Such failures, now and again, bring fatalities and their decline has made the lot of a trainman much safer. There is, however, he added, one class of accidents which has tended to increase, viz., those resulting from jolts given to the caboose. There is more slack in a long train than in a short one and a careless engineman who handles his air or his throttle too suddenly finds the havoc he plays in the caboose increased in proportion to the length of the train. With a high standard of equipment maintenance, a long train is not necessarily any more dangerous than a short one. If it is not to be so, however, enginemen must be constantly impressed with the responsibility they have for

the safety of their fellows. In addition, also, greater attention might be given in some cases to the design of cabooses to eliminate points of danger in them—smoothing off a corner here, a little padding there, and so on. The fact that great improvement has been made in train service safety should not cause any let-down in efforts to effect still greater improvement.

Locomotive "Architecture" Here and in England

A SHORT time ago at Manchester, England, at a meeting of railway employees the principal speakers were Sir Josiah Stamp, "president of the executive" of the London, Midland & Scottish, and J. H. Thomas, the well-known railway labor leader. The latter dwelt at some length on the industrial situation in Great Britain and the necessity for co-operation by labor and management in helping the railways through the period of depression. Sir Josiah Stamp spoke of the excellence of the British railways, comparing them favorably, albeit good naturedly, with those in America. He said that they in Britain preferred their "smart" locomotives to those of America "which look as if they had had their insides taken out and hung around their necks." This criticism of Sir Josiah's has been made before. On the other hand, there are those who feel that a locomotive should be allowed to retain its resemblance to a somewhat elaborate machine, which it is, rather than to have all its vital parts camouflaged to give it the simplicity in appearance of a stationary boiler. The American railroads are today giving more attention to the appearance of their locomotives than they have in some time past. One road has gone frankly to the English type locomotive. Other roads, quite as interested in improving appearances, have restricted themselves to surface treatment—more and brighter paint, polishing, cleaning—without attempting to apply English locomotive "architecture" to their power. Tastes differ and uniformity is not necessary or even desirable. Let the roads follow their own inclinations as to what improved appearance consists of. Judgment can be rendered later as to the particular kind of beautification which the public will most appreciate. In the meantime improvement, no matter along what lines, is the important consideration.

Adapting Old Track Layouts to Modern Conditions

AMONG the many problems that confront the maintenance man, that of providing for the safe and expeditious movement of traffic over old terminal station layouts is one of the most interesting, as well as the most vexing at times, but also one that is capable of producing great savings if satisfactorily solved. Granted that the original plan was designed on sound principles, careful thought and study, based on the operations of the plant, will often enable such layouts to be kept in successful use long after the motive power has exceeded the limits adopted for the original plans. The Union station at St. Louis is an interesting case in point and the paper presented at the recent annual convention of the Roadmasters' Association at Chicago by H. J. Pfeifer, chief engineer of the Terminal Railroad Association of St. Louis, and abstracted in the September 25 issue of *Railway Age*, shows how the problem was met in this particular case. When one considers that this track layout was built over 20 years ago, that the leads to the station tracks have a curvature of 16 deg., with some crossover tracks with a curvature of 20 deg., and that these cannot be reduced without enormous expenditures for land and track changes, the importance of the achievement of operating trains hauled by the longest and heaviest locomotives of the eighteen roads using the station, with an almost entire elimination of derailments, may be realized. It is the common fate of all large terminals to be outgrown in time, but be it said to the credit of the engineer and the trackman that they are usually able to keep traffic moving over the rails as long as the station is in use, no matter how complicated the situation or how adverse the conditions may be.

Apprenticeship Training

DURING the past year, and particularly this fall, there has been a noticeable revival in apprenticeship activites in the railroad mechanical departments. The methods of approach to this problem and the practices followed must naturally vary from time to time, as conditions change. The noteworthy fact today, however, is the variety of methods that are being tried out. Some of the railroad mechanical departments—and the same thing is true in the industries—are utilizing a number of outside agencies and a few are receiving financial assistance from the federal vocational educational funds, provided for under the Smith-Hughes Act. Federal funds available under this act in 1926 amount to over seven million dollars, of which over three million dollars were allotted to industrial education, a like amount to agricultural education and about one million dollars to teacher training. Some roads are drawing upon correspondence schools or other educational institutions and industrial extension departments of state universities for assistance in meeting their problem, while others have organized strong apprentice departments and are developing practically all of their material and adapting their practices to meet the specific local conditions with which they are confronted. Practically all of the effort up to this time has been concentrated upon shop crafts apprentices, but there are indications that the work will be extended in some few places at least, and possibly largely on an experimental basis for the present, to boys and young men in the other departments. The present season gives unusual promise of developing much valuable material on which to build programs for more adequately meeting the needs in connection with the thorough development of the younger men in the railroad organization.

Whistling for Crossings

THE fabled "Philadelphia lawyer" renowned as possessor of the acme of ingenuity in solving puzzles—and, inferentially in inventing puzzles—has nothing on the judges and legislators of Missouri and New York. (See the two court decisions from these states reported in this issue of the *Railway Age*, dealing with the duty of the enginemen and of the railroad company in regard to giving adequate whistle warning when a train approaches a highway crossing.) For almost a hundred years the legislatures of the country have been endeavoring to put into statute books a perfectly adequate law prescribing for railroad crossings a regulation, or code of regulations, which shall provide perfect safety for wayfarers and absolute justice for the wayfarer and the railroad company. With all their efforts and ingenuity they have left the engineman a complicated duty in which, as in the case

quoted from Missouri, he may do his very best and yet find himself violating the spirit of some statute. That is to say, the law requires the runner to make, in two seconds, a decision which the legislators may have discussed for an hour before coming to an agreement upon it. The New York case illuminates the subject from another angle. In either state—in every state—the engineman's puzzle, in any given instance, is liable to get into the courts and then his fate—or the railroad company's—is liable to be settled according to the tender mercies of twelve ordinary men—jurymen. Operating officers will be interested in reading these two decisions, especially young officers who have not thoroughly studied the lawyers' technicalities. Of the lessons which may be drawn from cases like these, one obvious one, which has heretofore been noted in these columns, is that the duty required of enginemen by the rule should be made as simple as possible. This rule, like Rule 99, may be abbreviated or expanded or altered in all possible ways, as has been the case with Rule 99 for 30 years, and yet leave the engineman with essential features left to be decided by him on the spur of the moment. How to do this he has to learn largely by experience.

Railroads and Public Utilities in the Schools

THE report made by the Committee on Public Relations of the National Association of Railroad and Utilities Commissioners at the convention of this organization last week is an interesting document. The chairman of the committee is Commissioner E. I. Lewis of the Interstate Commerce Commission. The principal subject dealt with is the kind of information regarding management and regulation of railroads and public utilities being given to students in colleges and public schools. Whether correct or misleading information about these matters is being given to the rising generation is a question of importance to public service corporations and the public.

The committee within the last year made a survey of the situation. It found that many of the larger colleges and universities now have courses "in fundamental economic principles underlying public utility businesses and emphasizing the economic, financial, legal and managerial principles underlying operating and management, and the problems arising out of public regulation and control." In other words, it found that in most colleges and universities the text-books used and the teachers who use them are such that students are given some understanding of the great changes that have occurred within the last fifteen or twenty years in both the management and regulation of railroads and public utilities.

The survey disclosed that the situation is widely different in public schools, including high schools, as respects both textbooks and teachers. "It was found," says the report "that many of the text-books still in use were written in the early part of the century when there was great public agitation against abuses, practices and attitude of corporate public servants" which resulted in the adoption of the present policy of regulation. "These text-books emphasize among other things: Corporation graft; disregard of public sentiment; corruption of legislatures and councils; the necessity of the people protecting themselves against crooked legislatures; councils and officials giving away valuable franchises; * * * the watering of stock. * * * Being of a date prior to the general assumption by the states of their power to regulate, these texts are innocent of statement of the application of the police power which is now almost universally exercised. There is no enlightenment as to reasons for regulation, or instruction as to how it is applied. The avenue of escape generally pointed out is 'municipalization and nationalization' "—that is, government ownership. Some text-books written within the last five years are better. "The (Interstate Commerce) Commission is credited with having been of great service to shippers, stockholders and the general public, but it is observed that evils still exist, and that some people feel that no form of regulation, however complete, will solve the problem and that to them the final outcome will be government ownership and operation."

Teachers in general, apparently, were found no better than text-books. "Many were educated in the days of the old order of things, and their ideas continue to be of that pre-regulation age that pretty much is history instead of actuality. * * * Our survey leaves no doubt that badly informed or prejudiced teachers do great harm by instilling in the minds of the pupil misunderstanding and distrust of bodies corporate."

This is a severe indictment of the instruction being given to a very large part of the young people of the United States, coming as it does from a committee composed of federal and state officials who are especially informed regarding the matters of which they speak. There has been a revolution in the management and regulation of public utilities and railroads within the last twenty years. The features of management about which there was formerly so much complaint, whether justifiable or not, have been eliminated. Management now is so closely supervised by regulation that both the bad and good qualities of present financing, service and rate making must be attributed to both management and regulation. Regulating commissions are not prone to exaggerate the virtues of the public utilities and railroads under their control. Here, however, is a committee composed of federal and state regulating commissioners whose members evidently have been somewhat shocked by the discovery of how many former abuses and how many ancient calumnies of public service concerns are still being raked up and retailed to the young people of the country as a part of their "education."

The findings of this committee undoubtedly help to explain why some charges against the railways which a quarter of a century ago were made with more or less truth, but which today are not true, continue to be made and widely believed. One of the most harmful of these charges is that of stock watering. There has been practically none of this in the railroad business for a long time, and yet the charge that it prevails is still often encountered, especially in rural districts. Its longevity probably is mainly due to the kinds of text-books and teachers referred to in this report.

The continuance of such instruction of the young is an injustice to the railroads and public utilities and hardly less unjust to the members of government regulating bodies. We have now had very effective regulation in this country for twenty years, and such instruction as that outlined, if it were based on facts, would show that the regulating commissions have utterly failed to serve the purpose for which they were created.

The Committee on Public Relations of the Association of Railroad and Utilities Commissioners recommends that there be prepared in a simple and accurate form material for text-books setting forth the facts regarding present day management and regulation of railroads and public utilities. It "expresses the opinion and recommends that the undertaking is worthy at least an appropriation sufficient to engage a competent text-book writer to prepare the material." Doubtless it means

that this writer should be employed by the association and that the various public utilities commissions should undertake a campaign to reform the teachers and text-books in their various states.

Meantime, the question of what should be done merits consideration by the managements of railroads and public utilities. It is highly injurious to them to have the citizenship of the country grow up with prejudices which must be constantly combated to prevent them from causing destructive regulation.

Significance of Recent Car-Loadings

THE most significant fact about the recent record-breaking car-loadings of the railways is that they have resulted from phenomenal shipments of a wide variety of commodities.

The most outstanding increase has been in bituminous coal shipments. Since the week ended September 12 they have regularly exceeded 200,000 cars weekly, this being the first time they have been so large since the fall and winter of 1920; and in the week ended October 30 they amounted to 236,776 cars, or about 13,430,000 tons —the largest loadings ever reported in a single week in history.

Shipments of other basic commodities have been extraordinarily large. Those of forest products have been the greatest since 1923 and have closely approached the high record of that year. Shipments of ore have been larger since the middle of September than in the corresponding part of any previous year.

Meantime, shipments of less than carload merchandise and miscellaneous freight have set some new records. The loadings of less-than-carload merchandise in the week ended Ocotber 23 were the largest ever reported—277,905 cars. The loadings of miscellaneous freight in the week ended October 16, amounting to 462,348 cars, also were the largest ever reported.

These figures are significant because they reflect great activity, not merely in one or a few lines of industry and commerce, but in many.

The increase within the last two months in shipments of coal has been phenomenal, and has been partly due to exports of coal because of the coal mine strike in Great Britain; but even the increase in coal shipments has been mainly due to conditions in the United States, and the increase in loadings of other kinds has been due entirely to domestic conditions. They indicate that the production and consumption of commodities in general in this country are largely exceeding what they ever have been before, even in the war years.

Detailed railway traffic and operating statistics for October will not be issued for some weeks, but the information now available regarding total shipments of commodities and the practical absence of car shortages forecast that the complete statistics, when available, will show that October was the most remarkable month in the history of American railways with respect to the freight business handled and the operating efficiency with which it was handled. Total carloadings in the four weeks ended October 30 were 4,820,531. This record has never been approached except in the immediately preceding four weeks of 1926. The largest loadings in any four consecutive weeks of 1923 were 4,305,080; 1924, 4,376,576, and 1925, 4,424,945. Therefore all records for four consecutive weeks of any previous year were exceeded by almost 10 per cent.

A Worthy Project

PROBABLY there is no other subject that has been discussed more in the columns of the *Railway Age* than that of the "College Man and the Railroads." Officers of both railway and railway supply companies, from president down to the lowest rank, have shown their keen interest in the subject not only by writing in these columns but by papers and discussions at railroad club and association meetings all over the country. Many expressions of opinion worthy of study and many constructive suggestions have resulted from these discussions which received their first impetus in the *Railway Age* in 1921 when the Motive Power Club of The Pennsylvania State College, an organization of students studying railway mechanical engineering at that institution, wrote a letter to the editor inquiring: Do the railroads want college men? The need of having data available so that the student could obtain a perspective of the industry was one of the points stressed in that letter.

During the past five years a number of railroads have made extensive studies of the utilization of the college man in railroad work. Conditions in the way of employment and training have also been greatly improved and it can be said that the railroad industry compares quite favorably with other industries relative to the employment of college trained personnel. There is, however, much to be done towards assembling the facts and data whereby the young college student can obtain a picture of the industry that he is preparing himself to work in, so that he will be less liable to make the mistake of selecting an industry for which he is not fitted. A large portion of the material from which such facts can be obtained is scattered through the proceedings of the various railway clubs and associations as well as through the columns of the railway trade press. Considerable information must also be obtained from the railroads and railway supply companies to have such a picture complete.

The work of assembling the material from which facts and data pertaining to the opportunities afforded the college man in the railway industry is, in many respects, the job of the professional societies and not of the American Railway Association or any one of its divisions, which serve more in an official than in a professional capacity. The need for such facts and data is primarily that of a professional service although if properly used after once being assembled, it should be an important factor towards reducing the amount of misplaced personnel.

The American Society of Mechanical Engineers, through its Railroad Division, began the first of this year to assemble facts pertaining to the railroad and railway supply industries in order to assist the young mechanical engineer to a knowledge of these industries as it affects him personally and to place not only the society as a whole, but individual members as well, in a position to render real service toward the proper placement of mechanical engineers in the two allied industries. These industries were selected because of the fact that the need for such a service seemed to be evident and if the desired objectives were achieved, the same work could be carried out in other industries by the other divisions of the society. In other words, the project is in a certain degree an experimental one. A large part of the work of collecting material by library research has been completed, but information from the various railroads and railway supply companies is yet to be collected. The fact that this project by the Railroad Division of the A.S.M.E. is aimed not only to serve the young mechanical engineer, but also to reduce waste in the utilization of mechanical engineering talent due to misplaced personnel, should be an incentive for co-operation on the part of all.

New Books

When Railroads Were New. By Charles Frederick Carter. 324 pages, 8½ in. by 5½ in. Illustrated. Bound in cloth. Published by Simmons-Boardman Publishing Company, 30 Church Street, New York. Price $3.

The preface to this Centenary edition of Mr. Carter's book explains that the new edition was prepared in connection with the celebration of hundredth anniversaries of railroads such as in the case of the Delaware & Hudson Company in 1923, the New York Central and the Quincy Granite Railway in 1926, and the Baltimore & Ohio and the Pennsylvania in the near future and so on, up to the Canadian Pacific in 1985.

The author begins his book at a point where the possibility of rails being used to facilitate the movement of any four-wheeled vehicle was considered and employed. The first railroad to be completed in the United States was that from granite quarries near Quincy, Mass., to tidewater on the Neponset river, a distance of three miles. The rails were of wood faced with bar iron laid on ties of stone. Over this road two horses were able to draw loads of 40 tons at a speed of four and a half miles an hour. The Mauch Chunk railroad was finished shortly afterwards and was used to send loads of coal down-grade under the charge of men, while horses hauled the cars back. The history of railroads in this country began then, for it was not long until the pioneers in the field were looking to England, watching the work of Stephenson with the first of his locomotives and becoming interested in the development of the Stockton & Darlington road.

To American enthusiasts, it seemed only natural when they wanted to experiment with steam over American rails that they should order their locomotives from England, but peculiarly enough, those brought to this country were never very successful in operation.

It was not precisely that the locomotives were at fault, for they had operated successfully over English tracks. In this country, however, with wooden rails plated with iron and laid in stone, unevenly and erratically laid at that, English locomotives were not to be blamed for behaving temperamentally. One, the Stourbridge Lion, made an experimental trip over the Delaware & Hudson Company's railroad from Honesdale, Pa., to the mines at Carbondale, in 1829, but because the road was considered unsuited to locomotive operation, the Stourbridge Lion was run only once again. History then moves to the Charleston & Hamburg, where the Best Friend of Charleston, the first American locomotive, made history by proving successful and hauling the first train of the first regular passenger service in this country, January 15, 1831.

In August of that same year, the DeWitt Clinton hauled the first train over the Mohawk & Hudson,—a train made up of five stage coaches mounted on flanged wheels to enable them to run on rails.

After having told anecdotes and bits of picturesque history about the early experimental attempts to prove locomotives practical, Mr. Carter progresses with his history by setting forth the difficulties, trials and triumphs of the several large systems prominent in the early and later days of railroading. First he describes the birth of the idea for a line out of Baltimore and then the difficulties of financing the Baltimore & Ohio. He develops the building of different short lines between Ohio and St. Louis and pictures the mammoth celebration, first in St. Louis after approximately a thousand persons had journeyed by rail to that point upon completion of a series of connections from Baltimore to the Missouri city, and then, after a return trip, the similar celebration and huge feast at Baltimore. The Erie, the Pennsylvania, the Union Pacific, the Vanderbilt system, the Central Pacific, the Santa Fe, the Denver & Rio Grande, and the Canadian Pacific are the railroad pegs upon which the author hangs the story of his early history. This story is one of the struggles of finance, construction and operation of these roads.

The outstanding characteristic of this book is its surprising fascination. It would, of course, be interesting to any railroad man, but it is so to the lay reader as well. The interest for the reader is achieved by Mr. Carter's handling of a wealth of stories about persons, incidents and ideas concerned with early railroad history. He has built his book of these anecdotes, and has put them together in such a way that one gets a continued, vivid and memorable story of the time when railroads were new. L. G.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Directory of Agency Tariffs—Their Contents and Application, by Traffic Research Staff, LaSalle Extension University. Lists every agency freight tariff published, with series number, general description of contents, and general territorial application. The discussion of numbers of tariffs filed in 1925 may be discouraging to collectors. 239 p. Pub. by LaSalle Extension Univ. Press, Chicago, Ill. Paper-binding $2.75, cloth, $3.00.

Earning Power of Railroads, compiled and edited by Floyd W. Mundy. 21st issue of a well-arranged handbook interesting alike to students of railroad finance, and to persons who wish accurate information about railroads generally in convenient form. 535 p. New York, James H. Oliphant & Co.

Forty-Second Report of the Railway Accounting Officers Association. Reports, addresses, minutes, etc., of Quebec meeting. 411 p. Pub. by Railway Accounting Officers Association, Washington, D. C. $2.00.

Operating Statistics and the Divisional Officer, by Major F. H. Budden. Technical paper No. 249, Govt. of India Railway Board, discussing compilation, use, and value of statistics on railway divisions. An appendix contains list of statistics supplied to Railway Board by the Class I railways of India. 55 p. Pub. by Government of India, Central Publication Branch, Calcutta, India. Obtainable from London, Eng., Office of High Commissioner for India. 1 shilling sixpence or annas 14.

Railway Capital Expenditures and Performance (January 1 to October 1, 1926), by Bureau of Railway Economics. Its bulletin, Miscellaneous series No. 41. Report to American Railway Association, Nov. 17, 1926. 14 p. Pub. by Bureau of Railway Economics, Washington, D. C. Apply.

Transportation on the Great Lakes, prepared by Board of Engineers for Rivers and Harbors, War Dept., in co-operation with U. S. Shipping Board. Following a description of the Great Lakes and their connecting channels and harbors, the laws and regulations affecting them, the types of vessels, and characteristics of the commerce, the grain, ore, coal, other bulk freight, and package freight movements are taken up in detail, together with the car-ferry traffic. Maps, and illustrations supplement text. 426 p. Pub. by Govt. Print. Off., Washington, D. C., $1.50.

Periodical Articles

American Progress in Elimination of Waste, by Herbert Hoover. Secretary Hoover's tribute to railway accomplishments, p. 335-336. Commerce Reports, Nov. 8, 1926, p. 334-339; Nov. 15, 1926, p. 396-401.

The New Capitalism, by Frank Parker Stockbridge. Activities of the Brotherhood of Locomotive Engineers and other organizations in banking and investment. Saturday Evening Post, November 6, 1926, p. 5, 214-226.

Lighting of Classification Yards*

Data covering costs, general principles, power requirements and advantages of yard illumination

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LIGHTING of railway classification yards is a problem of space lighting, the length of yards varying from 3,200 ft. to 6,500 ft., the width from 400 ft. to 650 ft., and the distance from the hump to the last switch on the ladder, from 1,300 ft. to 1,800 ft. in our modern yards,—all depending upon the capacity of the yard. Ten tracks generally diverge from each ladder track. The space between the ladder tracks is used for the speeder cars which carry the hump riders back to the hump after cars have been brought to rest in the classification yard. In the case of a yard where car retarders are used, this space could be utilized for pole lines carrying a lighting distribution system.

No work other than the classification of cars is performed in the modern classification yard, the air testing and inspection being performed in the departure yard, and consequently there is no necessity for local or intense illumination.

The ladder tracks of classification yards are seldom built on curves; in fact, in yards where retarders are used, the curvature is limited to six degrees. Therefore there is an advantage in providing sufficient illumination to enable engine drivers to observe their respective courses.

The tracks connecting the classification and departure yards, covering a distance varying from 400 ft. to 700 ft., require local illumination. The most effective means of providing this illumination is by the angular type of reflector, with the beam of light directed in such a manner as not to affect the vision of the engine driver who is required to cover these tracks and who is frequently unable to obtain the benefit of the locomotive headlight because of the curvature of tracks and on account of switches. With the angular reflectors giving a wide beam, the proper spacing is about 100 ft. for 300-watt lamps at an elevation of 22 ft. above the tracks. A similar type of lighting should be installed at the hump for the benefit of the car riders. The departure yard, as stated above, requires very little illumination other than that necessary for police protection. The inspectors are required to work under cars and between long lines of cars on adjacent tracks and therefore they

Night View of the Cedar Hill Yard of the New Haven—Two of the Poles Shown Are a Part of the Old Lighting System and Will Be Removed

the problem of curved track lighting need not be considered.

There are two adjuncts to a modern classification yard; namely, the receiving yard and the departure yard. No illumination is ordinarily required in these other than that which is necessary for police protection or in cases where short trains are pushed into the receiving yard on the same tracks or diverging tracks, for the storage of previous trains. In some instances, however, where receiving yards are built with considerable curvature, carry lanterns. Moreover, it would be impractical and expensive to attempt to provide illumination for their benefit, and it would be impossible to show any financial saving or reduction of personal injury hazard.

Floodlighting Is Most Easily Adopted to Yard Requirements

Good illumination requires an even distribution of light without glare. In order to obtain this condition, lamps must be so spaced and so placed that there is no interference with one's vision. As space is valuable in a railroad yard, and as the expense of installing and

*Abstract of a paper presented before the New York regional meeting of the American Institute of Electrical Engineers, November 12, 1926.

maintaining such an installation is extremely heavy, we have been compelled to seek some other solution of the problem. The method commonly used is the installation of towers 75 ft. to 120 ft. above the base of the rail, with a number of projectors equipped with 750-watt or

Yard Equipped with Car Retarders, Showing Lighting Tower at the Right

1,000-watt lamps mounted on a platform at the top of the tower. The protective apparatus and switches are installed at the base of the tower in order to avoid all unnecessary maintenance labor. Practically the only necessity for climbing the towers is to change lamps and clean lenses and reflectors, which it is rarely necessary to do more often than every three months in winter and less frequently in summer. It is advisable to place control of the lighting in charge of the hump tower operator. This may be accomplished by installing a small start and stop button in a selected position, the manipulation of which energizes and de-energizes a contactor installed at the lighting tower. Another method is to install time switches at the base of towers which will automatically turn the lamps on and off at a predetermined time. The first method of control enables the tower operator to practice economy in current consumption during slack hours and yet furnishes sufficient light for police purposes. Tower lighting permits adjusting the position of the towers with the result that if space is not available for an ideal location, a change of 100 ft. or even 200 ft. does not materially decrease the efficiency of the installation. There is a possibility (although rarely available in classification yards) of taking advantage of high structures such as coal pockets and bridges for mounting projectors.

Classification yard lighting may be divided into three general classes or types, each requiring a different solution, as follows:

1. Yards employing hump riders and having hand-operated switches.
2. Yards employing hump riders and equipped with automatic switches.
3. Yards equipped with automatic switches and car retarders.

Yards Having Hand Switches and Employing Hump Riders

With the first type of yard, extreme care must be exercised to prevent interference with the switchman's vision on account of glare, as this is likely to be the cause of personal injury or accidents to the equipment. If space is available, two towers may be installed one on each side of the hump and 300 ft. apart. If lack of space at the hump makes this impracticable, a so-called "modified distribution system" is advisable and the towers may be installed on the outer edges of the classification yard in conjunction with 300-watt angular reflectors mounted on poles in the space occupied by speeder tracks which provide illumination in the area between the hump and the point where the tower lighting becomes effective.

The Cedar Hill Yard of the New Haven as It Looks in the Daytime

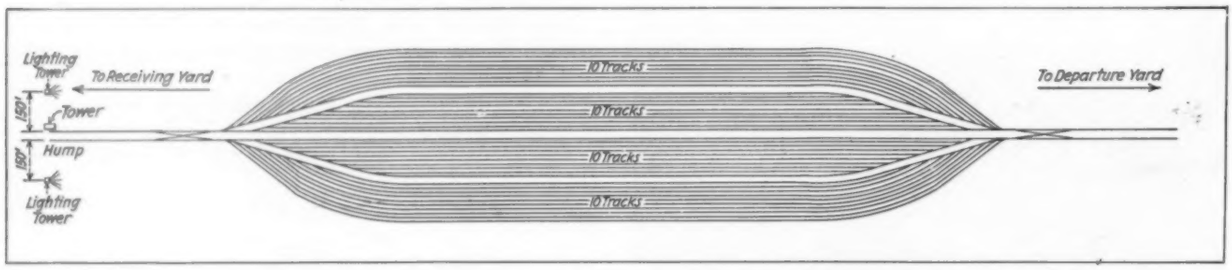
In very narrow yards it may be found desirable to install 500-watt projectors with a 250-ft. spacing and an elevation of from 35 to 40 ft. above the tracks, the necessary pole line being installed in the speeder car space. This latter method does not permit expansion and involves high maintenance costs as well as interference with the operators' vision by the poles; therefore it should not be installed. The cost of installing two towers at the hump amounts to approximately $7,000, and involves a low maintenance cost, whereas the "modified distribution system" costs at least $8,000 to install and results in a high maintenance cost.

With the second type of yard it is not necessary to

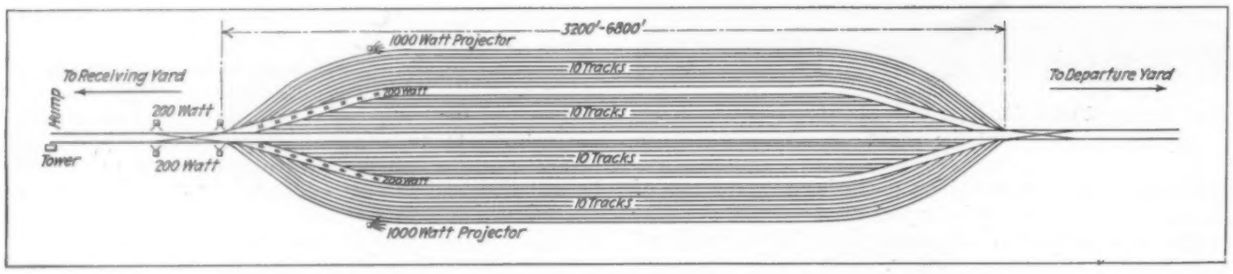
consider the glare as there are no men in the yard and the current of traffic is in the direction of the light beam. One or two towers may be installed in the same relative position as in the first type of yard, or, if space is not available at that point, they may be installed close to the hump. The cost of these towers will be approximately $7,000. For a 3,200-ft. yard no other lighting is required for the classification yard, an unobstructed view being obtained both from the hump and by the car riders. The power required for a 40-track yard is approximately 16 kw. The installation and maintenance cost is low. The maximum illumination is at the switches, and the hump rider is enabled to detect track conditions clearly; moreover, in distant parts of the yard sufficient illumination is provided to permit the observation of low built cars in time to avoid collision with them.

Yards Having Automatic Switches and Employing Hump Riders

Where yards are of extreme length it will be necessary to place at least two towers approximately 2,000 to 3,000 ft. from the hump in the yard, or where space is not available for this, the towers may be installed on the outer edges of the yard at the same distance from the hump. The wattage requirements for a 3,200-ft. yard are from 12 kw. to 16 kw. and decrease proportionately as the yard decreases in length. The increase in installation cost for a 6,000 ft. yard over a 3,200-ft. yard will amount to approximately $12,000, making a total installation cost of about $19,000, with a maintenance increase of slightly over 100 per cent. There is some possibility that at some time in the future, lamps of higher wattage may be used



Typical Lighting with Towers Located at the Hump



Modified Lighting System Where Space at Sides of Hump is Scarce

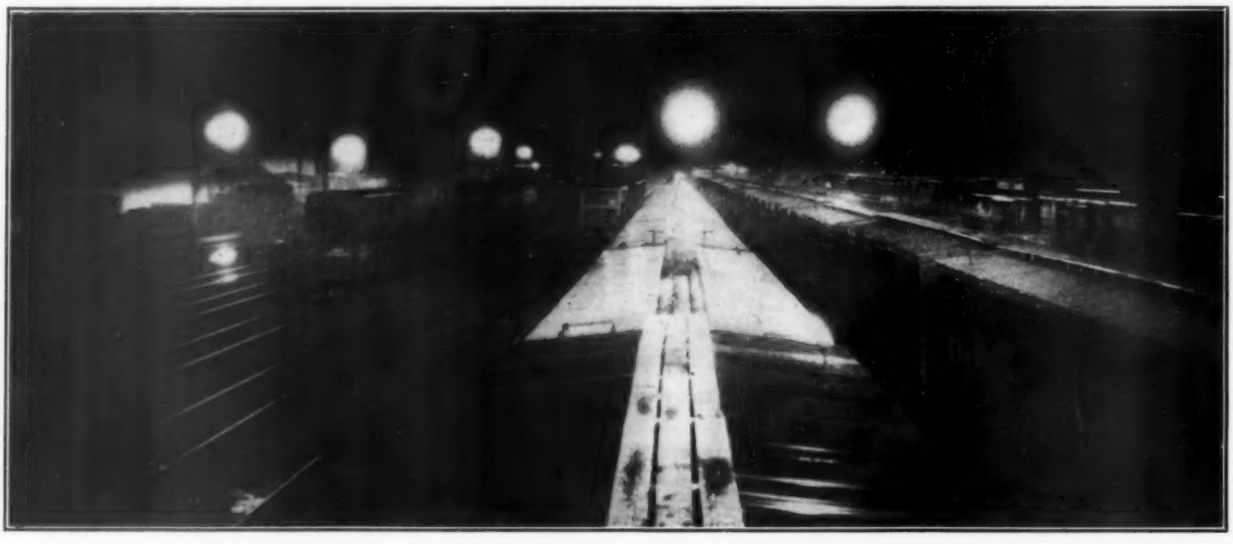


Illustration of Visibility Secured by Silhouette and Specular Reflection from the Rails and Sides of Cars

in the 5,000- and 6,000-ft. yards, with a resultant reduction in the number of towers required and a decrease in the installation and maintenance costs, but in considering any such proposition the possibility of interference with the vision of adjacent interests must be taken into account.

The third type of yard is similar to the first, but the personal injury hazard is eliminated as no hump riders or switchmen are required in the yard.

Yards Equipped with Automatic Switches and Car Retarders

The retarder operators are located in secondary towers situated adjacent to the groups of retarders which they control. These towers are in the area of the ladder switches and are at an elevation above the tracks which permits an unobstructed view of the yard. Up to the present time no economical solution of this problem has been worked out. If lighting as recommended for the second type of yard is installed, the glare interferes with the vision of the operators. In this connection it is possible that a visor effect may be obtained by painting the upper part of the tower windows, thereby shutting off from the operators' vision the direct beam of the lights.

Two 70-Foot Towers, Each Equipped with Eight 1,000-Watt Projectors and Located Close to the Hump Used for Lighting the 3,200-Foot Cedar Hill, Conn., Yard of the New York, New Haven & Hartford

The position of retarders with respect to the operator is frequently such that it is difficult for the operator to observe the exact postion of moving cars and of retarders at night on account of shadows. A possible solution of this problem may be found in "marker lights" so placed that they will indicate when the braking effect on cars is to be applied to the retarders. This solution of the problem would be very economical.

Any system of local illumination covering retarder areas would be expensive and would cause interference with track clearances, which must be avoided.

With the increased experience of retarder operators there will be no necessity for illumination greater than that provided in yards using hump riders and automatic switches, since each operator will know the loading condition of his tracks and will be governed accordingly. The same problem presents itself in lift-bridge operation, where actual practice has demonstrated that the experienced operator knows the position of his bridge at night and does not watch the indication lights, but prefers a marker light so placed that it will not be necessary for him to direct his attention in another direction.

Advantages of Yard Lighting

The committee on illumination of the Association of Railway Electrical Engineers in November, 1923, reported the following advantages of yard lighting:

1. Speeding up of cars handled in the yard at night.
2. Reduction in cars damaged by rough handling and collision in the classification yard with consequent reduction in claims, delay in delivery of goods, loss of service of damaged cars, etc.
3. Reduction in losses due to pilfering on account of more effective policing possible with a well illuminated yard.
4. Improved working conditions and increased safety for employees working in the yard.

The studies and investigations of the committee on illumination in conjunction with the lamp and projector engineers, although not as yet completed or published, have already resulted in more efficient units and more economical installations. The problem of lenses deteriorating with age, with resultant decrease of efficiency, has been practically solved. Curves and engineering data are now available which makes it posssible to plan installations with confidence that the results anticipated will be achieved. The problems of space lighting may be solved in various ways on account of local conditions, but the fundamental principles are the same in all instances.

Floodlighting is not a "cure-all," but the results are satisfactory to the operating people and provide for them the operating conditions which they have been seeking.

No mention has been made in this discussion of silhouette effect, since it is considered that while theoretically this feature may have some value, at the present time the effect on the vision due to glare more than offsets the benefits.

Further studies will be necessary before this type of installation can be recommended.

Acquisition of A. B. & A., by A. C. L., to Public's Interest

WASHINGTON, D. C.

THE Interstate Commerce Commission has issued a certificate authorizing a committee representing the bondholders of the Atlanta, Birmingham & Atlantic and a new company to be known as the Atlanta, Birmingham & Coast to acquire and operate the line of the A. B. & A., but while the report states that "there is no difficulty in reaching the conclusion that from the standpoint of transportation service the proposed reorganization and control by the Atlantic Coast Line is in the public interest," action on the applications of the new company for authority to issue capital stock and of the A. C. L. for authority to acquire control of the new company was deferred pending completion of the organization of the new company. Chairman Eas

mas filed a dissenting report. Upon receipt of proof of incorporation of the new company, accompanied by a copy of the charter, the report says the commission will dispose of the remaining applications by supplementary report and order.

The plan of reorganization proposes the issue by the new company of $5,180,344.07 of non-voting preferred stock in exchange for outstanding bonds at the ratio of $100 in bonds to $60 of stock, and 150,000 shares of common stock without par value to be acquired by the Atlantic Coast Line in consideration of the payment by that company of current outstanding obligations of the receiver, amounting to approximately $3,000,000, and, in addition, various expenses in connection with the foreclosure and reorganization, not to exceed $600,000. The A. C. L. is to guarantee 5 per cent cumulative dividends on the preferred stock and the report says that "as a practical statement of the situation it may be said that the Atlantic Coast Line is acquiring control of the A. B. & A. property by a cash payment of about $3,600,000 and the guaranty of an annual payment of about $260,000 in dividends." No recognition is given the stockholders of the A. B. & A. in the plans and some of them protested at the hearing arguing that in view of the commission's valuation of the property at over $23,000,000 as of 1914, and the earning prospects of the company, the price proposed is grossly inadequate.

"Our principal concern is with the future of the A. B. & A. property as a transportation facility," Division 4 of the commission says in the report. "* * * It serves a large territory exclusively and an exhibit was filed showing that it has 43 agency stations which are not served by any other railroad. It is said that 200,000 people are dependent solely upon the A. B. & A. for rail transportation. * * * It has long been recognized that the lines of the A. B. & A. would be of particular value to the system of the Atlantic Coast Line in affording north-and-south connections between the lines of that system and those of its affiliated companies. * * * The sentiment in favor of the plan in the territory served by the A. B. & A. is apparently unanimous and earnest. Approval should therefore be given and the necessary authority issued, unless there is something in the terms and conditions of the proposed acquisition, or in the consideration, so inequitable as to require modification in the public interest. We find nothing of this character in the arrangement. It is true that there is wide disparity between the proposed price to be paid by the Atlantic Coast Line for its control of the property and the value of the property viewed as a basis for rate-making, but our highest court has distinguished between value for rate-making purposes and exchange value. Whether or not the investment of the Atlantic Coast Line will be profitable can only be determined by experience; and even though that company, through contributions of traffic and by reason of other support, may be able to give the new company profitable returns from its operations, such a result would not indicate any inequity in the plan, either from the standpoint of the public or that of the stockholders."

Chairman Eastman's Opinion

Chairman Eastman in his dissenting opinion, said that what is proposed is a "consolidation" which the commission is without authority to approve, that the price is very low and that the property might with advantage be permitted to continue in receiver's hands longer, "concentrating attention on management and operation and fostering the upward trend of earnings." He also said that the matter of the reorganization expenses should have been inquired into thoroughly.

Hearings on Southwestern Merger Completed

WASHINGTON, D. C.

HEARINGS on the application of the Kansas City Southern for authority to acquire control of the Missouri-Kansas-Texas and of the latter to acquire control of the St. Louis Southwestern, which have been held before C. D. Mahaffie, director of the Bureau of Finance of the Interstate Commerce Commission, were brought to a close on November 13, after four days of hearing in Washington following the earlier hearings at Dallas, Tex.

Walter T. Rosen, of Ladenburg, Thalmann & Co., said that details of the proposed financial structure have not yet been worked out but that undoubtedly steps would be taken to increase the capitalization of the Kansas City Southern to provide for an exchange of stock for that of other companies if the commission approves the application.

This was brought out after Mr. Mahaffie had asked if it would not be just as easy to acquire control of the entire system as it would now be merely to acquire control of the Kansas City Southern alone. He brought out that at present market prices an investment of about $12,000,000 in the common stock of the K. C. S., would be sufficient to control, and asked if the witness considered that a safe financial structure. Mr. Rosen said that control could not be purchased at the present market price but that if the commission approves the plan a proper basis of capitalization can be worked out.

Opposition to the merger plan was voiced by W. E. Meyer, a director of the St. Louis Southwestern, who said he spoke for the holders of 14,000 shares of that company, on the ground that it would eliminate competition and tend to divert traffic from the Cotton Belt road to the M.-K.-T.

He said that the relationships of the Cotton Belt to the Southern Pacific are more important than those with the M.-K.-T., and that the proposed grouping would imperil the large interchange with the S. P., and that the present control has been exercised by the majority in utter disregard of the interest of the minority stockholders of the Cotton Belt. To A. Hamilton, consulting engineer, testifying for the Cotton Belt minority, pointed out many ways in which he said that under the plan proposed the interests of the Cotton Belt might be subordinated to those of the M.-K.-T., and he described the results of an inspection of the Cotton Belt which, with his experience in operating lines in the same territory, convinced him that the Cotton Belt is fully able to maintain its position in the Southwest if left independent.

Testimony in opposition to the merger plan as proposed was also given by C. E. Ingersoll, president of the Midland Valley and the Kansas, Oklahoma & Gulf, and by Charles T. O'Neal, general manager of the Fort Smith & Western, who expressed the fear that the merger would result in taking away a large amount of traffic now routed via the connecting short lines. Testimony in rebuttal was offered by J. F. Holden, vice-president of the Kansas City Southern, and C. Haile, vice-president of the M.-K.-T., who said that joint routes and through rates via the short lines would be maintained and also that there would continue to be competition between the Kansas City Southern, Missouri-Kansas-Texas, and Cotton Belt even if there were a common stock control.

A. R. A. Meets in New York

Record breaking volume of business with best service ever to shipper—Equipment in good shape

REVENUE freight car loading for the 52 weeks of 1926 is estimated at 52,700,939 cars, an increase of 1,532,979 cars or 3 per cent over that of 1925, in a report of the Car Service Division of the American Railway Association approved at a meeting of the board of directors of the A.R.A., at a meeting in New York on November 17. The report reviews the transportation conditions for the first ten months of 1926, showing that the railroads are furnishing the shippers the best transportation service they have ever had, and that, while the volume of freight handled has been greater than ever before, it has been met without transportation difficulties or car shortage except in minor instances of a temporary nature.

The performance of the railroads is attributed largely to the enormous capital expenditures which the carriers have made for improvements during the past five years and also to the hearty co-operation that the shippers have given through the various Shippers' Regional Advisory Boards.

Locomotives in Order

Despite this record freight movement the percentage of locomotives awaiting repairs is lower now than at any time on record, while there are fewer freight cars awaiting repairs than at any time since the adoption of the program to provide adequate transportation in 1923. At the same time, the railroads on October 15 had 4,200 serviceable locomotives in storage while they also had on October 31 approximately 81,000 surplus freight cars in good repair and immediately available for service.

Freight cars placed in service during the first nine months this year totaled 85,383 and by January 1 it is expected that this number will be approximately 97,000. While the number of cars owned on October 1 this year was only an increase of about 38,000 or 1.6 per cent compared with January 1, 1923, the average carrying capacity has increased 2.05 tons per car.

The railroads on October 1 also had 1,526 fewer locomotives than on January 1, 1923, but there was an increase of nearly 10 per cent in the average tractive power of the locomotives owned.

"There has been," said the report of the Car Service Division, "a general tightening up in the car supply coincident with the extremely heavy loading during the past six weeks. One of the greatest avenues for assistance to the railroads by the Shippers' Regional Advisory Boards lies in the direction of the more prompt handling of equipment. In the program calling for an adequate transportation service adopted by the railroads in 1923, an appeal was made to the public to assist the railroads in every way possible in the more prompt loading and unloading of equipment and to eliminate the waste in the use of equipment by more nearly utilizing its full carrying capacity. Reports filed with the Interstate Commerce Commission show that the railroads in 1920 collected $30,505,039 in demurrage. In 1925, $20,391,640 was collected, a decrease compared with 1920 of 33 per cent. This has contributed in very large measure to the available equipment supply. No doubt a great deal of it has resulted from the effect of dependable railroad service, without car shortage or congestion, in the fall months, which has reflected itself in a reduction in stocks at destination, permitting prompt unloading of equipment upon arrival.

"The continued heavy loading of steel, ore, sand, stone and gravel, the steady increase in the weekly production of bituminous coal and the seasonal movement of sugar beets and sugar cane has practically eliminated the surplus of open top cars held in reserve by the railroads, and while we are undoubtedly in the peak loading period of the year, no serious shortage of cars has developed. The open top car loading of all commodities is averaging approximately 81,000 cars per day compared with 68,000 a day during the corresponding period last year or an increase of 19 per cent.

Coal Production Higher

"Bituminous coal production from January 1 to October 23 this year totaled 447,312,000 tons, an increase of 42,642,000 tons over the corresponding period last year and only 3.6 per cent under the same period in 1923, which was the highest production over a similar period for any year since the war. Bituminous coal production for the week ended on October 23 was 12,612,000 tons, and, as all indications point to a further increase in loading of coal for export because of the prolongation of the English strike and seasonal increase incident to the fall and winter months, together with the industrial activity now existing, it is possible and very probable that the weekly production during the remainder of the year will be approximately 13,000,000 tons, exclusive of holiday weeks.

"The dumping of coal for export at North Atlantic ports during the month of September totaled 2,769,253 tons, compared with 383,947 tons during the month of September 1925 and the total dumping of coal for export from January 1 to September 30 inclusive, at the same ports, totaled 11,602,469 tons compared with 4,279,135 tons during the corresponding period in 1925.

"The increase in the weekly production of bituminous coal at the present time compared with the same period in 1925 just about offsets the increase in exports. There is ample coal being produced, exclusive of the export shipments to foreign countries to take care adequately of all domestic requirements.

"Outstanding embargoes have remained at a minimum throughout the season, with isolated situations here and there where necessity has existed for control of the movement to individuals or industries. No embargoes have been issued by reason of transportation disability.

"The western railroads went through the entire grain shipping season without necessity for resorting to embargoes in order to control the movement to primary markets. This very heavy movement was handled entirely by a full measure of co-operation between the railroads and the Grain Terminal Committees of the Advisory Boards representing shippers.

"Generally, an adequate supply of refrigerator cars has been maintained throughout the year and we believe there will be no difficulty in meeting all of the requirements for that class of equipment for the entire year. In spite of the fact that the total perishable loading from August 1 to October 22 this year was practically as heavy as during the same period last year when the

movement was the largest in the history of California, there was not a single day of car shortage for any commodity."

Expenditures Increased

Capital expenditures made by the Class I railroads during the first nine months this year for improvements to the transportation plant and for the expansion of its capacity, including improvements in and additions to railway facilities, locomotives and cars, totaled $629,000,000, according to a report submitted by the bureau of railway economics of the A.R.A. at the annual meeting of that Association in New York, November 17. This was an increase of approximately $100,000,000 over similar capital expenditures made during the corresponding period last year.

On the basis of capital expenditures made during the first nine months this year, it is estimated that the total capital expenditures for the year will amount to $875,000,000. This estimate for 1926 compares with actual capital expenditures since 1920 as follows:

1920	$653,267,000
1921	557,035,000
1922	429,273,000
1923	1,059,149,000
1924	874,743,000
1925	748,191,000
1926 (Est.)	875,000,000
Grand total (7 years)	$5,196,658,000

While the actual expenditures made from January 1 to October 1, this year, amounted to $629,000,000, the railway managements during that period have actually authorized capital expenditures amounting to $1,175,000,000. This includes $475,000,000 in unexpended authorizations brought over from 1925.

Equipment Expenditures

Comparing the capital expenditures made during the first nine months in 1926 with those during the corresponding period in 1925, it appears that there were increases not only in the total of equipment purchases but also in all other classes of capital improvements. Capital expenditures for equipment during the first nine months amounted to $271,023,000, an increase of $15,130,000 over the corresponding period in 1925. For locomotives, expenditures amounted to $72,324,000, an increase of approximately $30,000,000 over the same period last year. For freight cars, $143,265,000 were expended, a decrease of $31,107,000 under the year before, while for passenger train cars, $43,403,000 were spent compared with $29,645,000 the year before. There was also an increase of $2,500,000 in 1926 over 1925 in expenditures for other equipment.

Capital expenditures for roadway and structures in the nine months' period this year amounted to $358,070,000, an increase of nearly $79,000,000 compared with the first nine months last year. Of this amount, $124,084,000 were expended for additional track, an increase of nearly $25,000,000 over 1925, while $29,531,000 went for heavier rails, an increase of $4,500,000 over the same period in 1925. For additional ballast, $12,059,000 was expended in the nine months' period this year or $4,000,000 more than was spent for that purpose in the preceding year. For shops and engine houses, including machinery and tools, capital expenditures amounted to $29,115,000 compared with $22,676,000 in 1925. All other expenditures amounted to $163,281,000 compared with $123,878,000 during the first nine months last year.

Bureau of Economics Report

A review of the first nine months of 1926 prepared by the Bureau of Railway Economics of the American Railway Association was submitted to the railway executives in New York in connection with the annual meetings of the American Railway Association and the Association of Railway Executives.

"Viewing railway operations," said the report, "as a whole during the first nine months of 1926, the conclusion is clear that the railways showed substantial gains in performance. In fact, there was marked improvement in virtually every factor or measure of operating efficiency.

"The principal economic factors underlying this consistent and continued improvement from 1921 to 1926 appear to be the capital expenditures of more than five billions of dollars since 1920; greater co-operation on the part of shippers, not only through Regional Advisory Boards which have been organized throughout the country, but also in their individual capacities; and the more effective utilization of a greatly improved railway plant.

"Briefly summarized, the first nine months of 1926 was a period of marked efficiency and economy in the transportation service rendered to the American public.

"Comparing the first nine months of 1926 with the average for the corresponding period of the previous five years, the total freight traffic, measured in net ton-miles, increased 18.5 per cent. This freight traffic in 1926 was not only greater than the average for the preceding five years but was also substantially greater than that for each of those five years, breaking all records for the first nine months of any year.

"In the freight service, the total number of train-miles increased more than eight per cent over the corresponding averages of the previous five years. The total number of freight-car miles increased nearly 21 per cent, indicating that more cars were handled per train and per locomotive. The average number of freight cars per train was 45.1 in the first nine months of 1926, which was greater than for any previous year.

Increase in Tractive Power

"While there was a decrease of 3.6 per cent in the number of freight locomotives owned by the railroads, there was an increase of ten per cent in the average tractive power of locomotives. At the same time there was a reduction of 26 per cent in the number of locomotives in need of repair compared with the previous five year average.

"The average number of freight cars owned by the railroads increased two per cent, and there was an increase in the average capacity from 42.4 tons at the beginning of 1921 to 44.8 tons on January 1, 1926. At the same time, there was a reduction of 31.5 per cent in the number of freight cars in need of repair.

"The average speed of freight trains for the first nine months this year was twelve miles per hour, an increase of five per cent above that for the previous five years. The average number of miles which each freight car traveled per day was 29.9 miles during the first nine months this year, an increase of 18.2 per cent above the five year average. Both of these averages—train speed and miles per car per day—were higher in 1926 than in any one of the previous five years. For the month of September alone, the average movement per car per day was 32.7 miles, which was the highest average for any month on record, the previous record having been established during the month of October, 1925, when it amounted to 32.2 miles.

"The average number of miles each freight locomotive traveled per day was 60.6 miles, an increase of more than twelve per cent above the average for the previous five years while gross ton miles per train hour was the highest on record.

"Greater efficiency was obtained in the use of fuel during the first nine months this year than in any corresponding period, an average of 135 pounds of coal having been required to haul a thousand tons of freight and equipment one mile. This was the lowest average on record.

"The average load per freight car was one of the few performance averages that did not show material improvement. The average load per car for the first nine months this year was 27.1 tons. While this was greater than in 1922, 1924 and 1925, it fell below 1921 and 1923. Careful analysis of the commodity statistics show that the failure of the average load to increase in view of the heavy traffic which the railroads have been called upon to move this year was due in part to the larger proportion of the lighter loading commodities carried in 1926. In addition, the responsibility for heavier loading rests in part on the shippers.

Passenger Traffic Off

"Passenger traffic in the nine-month period of 1926 showed a decrease of a little less than one per cent under the corresponding period last year while it also fell below the total

for the first nine months of each of the preceding five years except in 1922.

"The net result of this considerable increase in freight and slight decline in passenger traffic, as compared with the five-year average, was an increase in total operating revenues during the first nine months of 1926 of nine per cent. Compared with 1925, the increase was nearly five per cent. This increase occurred in the face of reductions in the average revenue for carrying a ton of freight one mile which amounted to 1.089 cents during the first nine months in 1926 compared with 1.267 cents for the same period in 1921, or a reduction this year of 14 per cent compared with five years ago. Operating expenses increased a little more than one per cent in 1926 compared with the five year average and three per cent over 1925. The ratio of operating expenses to gross revenues for the nine months period this year was 73.46 per cent compared with the five year average of 78.86 per cent. This reduction indicates a marked improvement in the economy and efficiency of railway operation.

"Taxes paid by the railways to local, state and federal governments have increased steadily, having been for the first nine months this year nearly forty per cent greater than in 1921.

"The net railway operating income of the Class I carriers also showed improvement for the first nine months this year compared with the corresponding periods in previous years due to the increased traffic and the high record of efficiency attained. Despite their record business, the railways have earned only a moderate return on their property investment, (including materials, supplies and cash), the rate for the first nine months this year being 5.22 per cent."

Approval of L. & N. E. Lease Recommended

WASHINGTON, D. C.

A FINDING by the Interstate Commerce Commission that the proposed lease of the Lehigh & New England by the Reading, conditioned on its maintenance as an open route, will be in the public interest, is recommended by C. V. Burnside, assistant director of the commission's Bureau of Finance, in a proposed report made public on November 12. The lease had been vigorously opposed by the Pennsylvania, which had proposed a joint control of the line, one of the important gateways to New England, by the Baltimore & Ohio, the New York Central, the Reading and the Pennsylvania.

"At the hearing and again in its brief," the report says, "the Reading declared its willingness that the commission attach to its order approving the lease the condition that the lessee shall maintain every joint route and rate in which the New England now participates, until changed either by voluntary action of all interested carriers or by order of the commission. With this addition, the commission should find that the terms and conditions of the lease and the proposed consideration are just and reasonable and should approve and authorize the proposed acquisition. The record affords no basis for requiring the establishment of specific new routes as requested by the Western Maryland."

The predominant question of public interest in this proceeding, Mr. Burnside says, concerns the provision and maintenance of efficient short-line all-rail routes between New England and the territory southwest of New York Harbor, and he adds that the opening of routes by way of the New England and Campbell Hall, using the best available junctions on the south, would in a great majority of cases result in substantial saving in distance as compared with the best route now in use.

Should the lease be approved, the report points out, it is the announced purpose of the Reading to establish rates via the New England between its own territory and northeastern territory, including New England, and northern and eastern New York, including rates on anthracite coal, and it is proposed to make the new routes available to the Reading's connections.

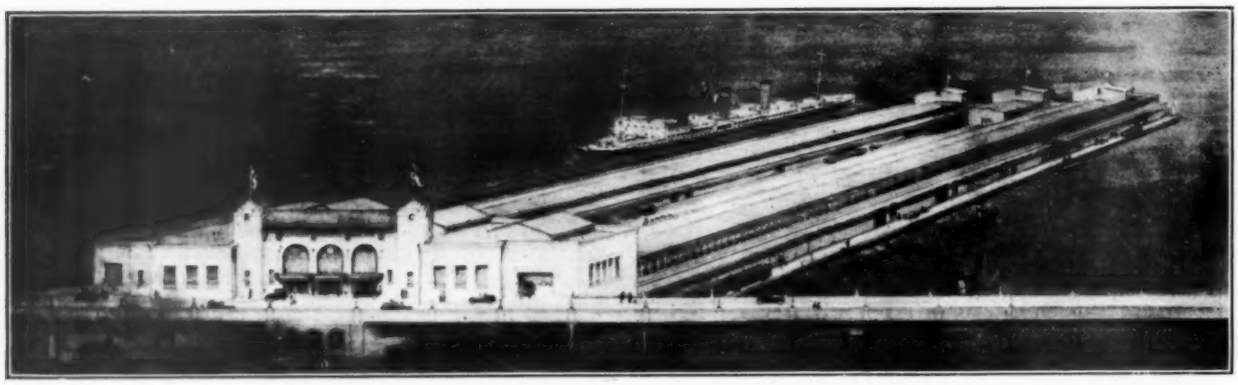
"There is no doubt" the report says, "that public confidence in the Reading's proposal would be increased if it were to divest itself of its stock in the Lehigh & Hudson River. However, the injunction regarding the preservation of competition must be read and considered in connection with the provisions of section 5 as a whole and in full view of the general intent of Congress in the enactment of the transportation act, 1920. Although it is not to be assumed that Congress intended the complete disregard of conditions which led to the enactment of the anti-trust laws, it is nevertheless clear that the transportation needs of the country were primarily in mind. It is also reasonable and necessary to assume that in enacting this extraordinary provision Congress had also in mind the greatly enlarged powers of the commission in regulating the service and rates of the carriers * * * * There has been no apparent change in the view of Congress since the passage of the Transportation Act, and should existing laws prove insufficient to protect the public interest in transportation, it is to be presumed that Congress will enact such additional legislation as may be found necessary to effect its purpose. The tentative plan for consolidation of the carriers was cited both for and against the proposed lease. In that plan the commission proposed the assignment of both the New England and the Lehigh & Hudson River to System No. 3 which included the Baltimore & Ohio, the Reading, and the New Haven, or, as an alternative to System No. 7, made up of the New Haven and other New England lines. In either case, both of the lines were to be placed under one management, supplementing each other in the transportation between New England and the territory southwest of New York Harbor."

The principal interchange of the New England is now with the Reading and the Jersey Central on the south and with the New Haven on the north. Following is a statement of the number of loaded cars interchanged by the New England with all of its connections for the years 1924 and 1925 and for the first eight months of 1926:

	Received			Delivered		
Connecting line	1924	1925	1926	1924	1925	1926
Reading	18,639	21,895	14,049	14,045	13,835	9,685
Central of New Jersey	28,448	34,409	20,310	23,947	26,136	17,755
New Haven	443	398	340	30,711	35,645	20,277
Chestnut Ridge	2,767	4,076	2,544	2,180	2,652	2,053
Delaware, Lackawanna & Western	2,676	3,756	1,916	4,787	4,701	2,740
Erie	1,552	1,567	1,094	5,871	5,663	3,414
Lehigh Valley	3,227	3,637	2,338	8,441	11,814	8,018
New York, Susquehanna & Western	712	644	522	8,396	9,174	5,239
New York Central	2,042	2,272	1,137	3,328	2,762	1,701
New York, Ontario & Western	316	157	92	4,830	4,095	3,233
Northampton & Bath	7,624	5,614	4,223	5,073	7,309	3,222
Pennsylvania	4,694	4,901	3,272	11,244	10,710	6,786

Reduced to percentages, the number of loaded cars received by the New England from the Reading and Central of New Jersey was 64 per cent of the total in the year 1924, 67 per cent in 1925, and 66 per cent for the first eight months of 1926.

BEGINNING ON DECEMBER 1, the timekeeping and divisional accounting work on the Central Pennsylvania general division of the Pennsylvania Railroad, which at present is done in the superintendent's offices on each division will be transferred to the general division accountant at Williamsport, Pa. Clerical forces of the four division superintendents will be moved to Williamsport. The change will affect about 75 persons. The general division accountant is to be relieved of that portion of the stores accounting work which relates to stores' records only. This will be taken care of by the general storekeeper's organization.



An Architect's Drawing of the New Canadian Pacific Pier at Vancouver, B. C.

Canadian Pacific Builds New Pier at Vancouver, B. C.

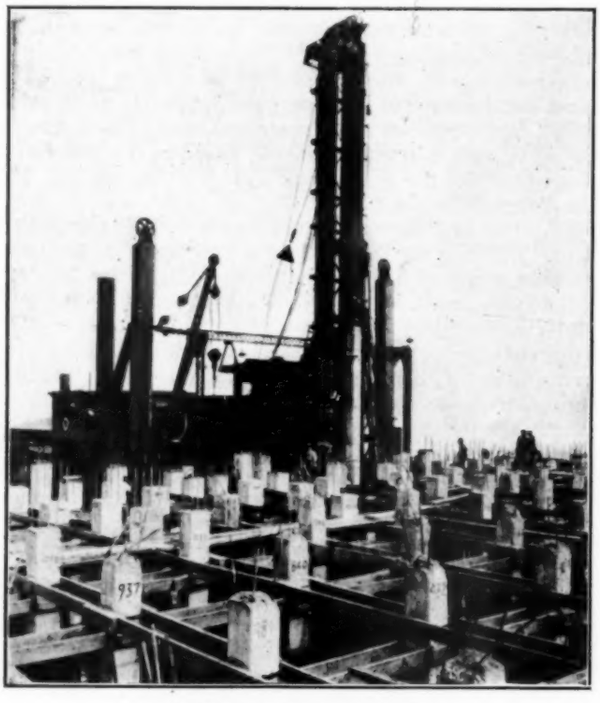
Reinforced concrete is used for substructure of new facilities for Pacific ocean trade

THE Canadian Pacific is completing an important addition to its western terminals in the form of its new pier B-C, at Vancouver, B. C., to meet the demands being made by the rapid increase in the growth of Pacific trade. The Canadian Pacific is interested chiefly in the trade with Japan, China, Australia and New Zealand, which is of a very mixed and general character, and of which the most valuable single article handled is silk. As the transportation of this commodity from the Orient to the mills in New York involves exceedingly keen competition, it is necessary to transfer silk shipments from boat to rail with the least possible delay. With these considerations in mind the new pier has been planned with special reference to the trans-Pacific ships owned by the company, of which the largest is the Empress of Canada, a vessel 640 ft. long and of 22,000 tons gross register. In addition to the company's own boats the new pier is intended to accommodate the Canadian Australasian Royal Mail Line, the Royal Mail Steam Packet Company, boats of the Isthmian, N. Y. K., and O. S. K. lines as well as other vessels which frequently apply for terminal facilities. The company also proposes to handle much of its local coastwise service at the pier. Since the new structure will provide berthing accommodation for at least five large vessels simultaneously, there is no doubt that this volume and variety of traffic can be handled satisfactorily. The company has endeavored to equip the new pier with every facility for the handling of passengers, baggage and cargo, and it believes that the new structure will be one of the most complete and efficient of its kind.

Arrangement of the Pier

The new pier is situated between the existing piers A and D, where the company contemplated originally the building of two separate piers, hence the designation, B-C. The structure, which is 1,100 ft. long by 331 ft. wide, is the first permanent construction the company has undertaken in its work of port development, the substructure being of reinforced concrete and the two-story headhouse of structural steel, while the only timber construction used is in the single deck freight sheds.

The inshore approaches to the new structure are elaborate, but are designed for simplicity in operation and to prevent traffic congestion. A steel viaduct 1,000 ft. long and wide enough at its narrowest point to accommodate four lines of traffic, connects both Granville and Burrard streets with the upper deck of the headhouse. Dropping from the Granville street approach to this



Driving Concrete Piles

viaduct a ramp with a grade of six per cent leads to the level of the railway tracks and the lower deck headhouse or the pier proper, while another ramp drops from the Burrard street approach of the viaduct toward pier A.

The headhouse covers the full width of the pier. On its upper floor are a concourse, general facilities for handling passengers, a baggage room, and office and store rooms for the Canadian Pacific ocean steamship services. On the lower floor are provided storage space, driveways into the sheds and entrances for the eight railway tracks.

The two single deck sheds are each 109 ft. wide, lying on either side of a central depressed track area containing four tracks, and flanked on their outer sides by areas each containing two tracks. The total freight storage space is about 202,000 sq. ft., while the car storage space provides capacity for about 200 freight cars.

Ample natural lighting is provided for the sheds by windows located in the tops of the sliding doors and by a continuous line of windows in the walls of the sheds over these doors and also in the walls of the monitor roof. A promenade leading from the headhouse and making a complete circuit of the pier is built at the outer edge of the roof of the sheds. From this promenade connections are made with ships by long gangways so that passengers may embark and disembark without interfering with the handling of freight on the deck of the pier.

Interior View of Freight Shed

Freight Handling Facilities

Ample arrangements are made for the transfer of freight. As already stated two railway tracks run along the deck outside the sheds on each side of the pier, while a traveling gantry crane runs along the edge of each side of the pier, this arrangement allowing such commodities as lumber, automobiles, etc., to be transferred directly from railway cars to ships or *vice versa*. The four depressed tracks in the center of the pier are for the transfer of freight to and from the sheds. Continuous sliding doors are installed on both the inner and outer sides of the sheds, and consequently freight may be transferred directly from the slings to railroad cars in the center of the pier. On the inboard side of the sheds the columns supporting the roof have been set back 10 ft. from the line of the sliding doors so as to avoid the necessity of spotting cars closely.

Special Equipment

Of the special equipment provided on the pier, perhaps the most important is the system of eight marine elevators, three on each side and two on the outboard end. These elevators, known on the Pacific coast as the Barlow type, are constructed so that when the elevator is lowered an apron projects outward into the side port of local coast boats, thus enabling freight to be moved directly from the ship to the deck of the pier. Most of the coast boats are loaded and unloaded entirely from their side ports, but the ocean going vessels use their side ports only for the transfer of baggage, silk and similar valuable cargo. The deck of the pier above these marine elevators consists of a steel bridge which is constructed so as to carry the two railway tracks and the crane rail. Mechanism is provided so that these bridges may be hoisted vertically a distance of 15 ft., thus clearing the elevator shafts for the operation of the elevators. In addition to the Barlow elevators, there are two 10-ton baggage elevators connecting the deck of the pier with the baggage room on the upper floor of the headhouse. On the viaduct between piers B-C and D there is also installed one 20-ton team elevator with a 12 ft. by 35 ft. platform.

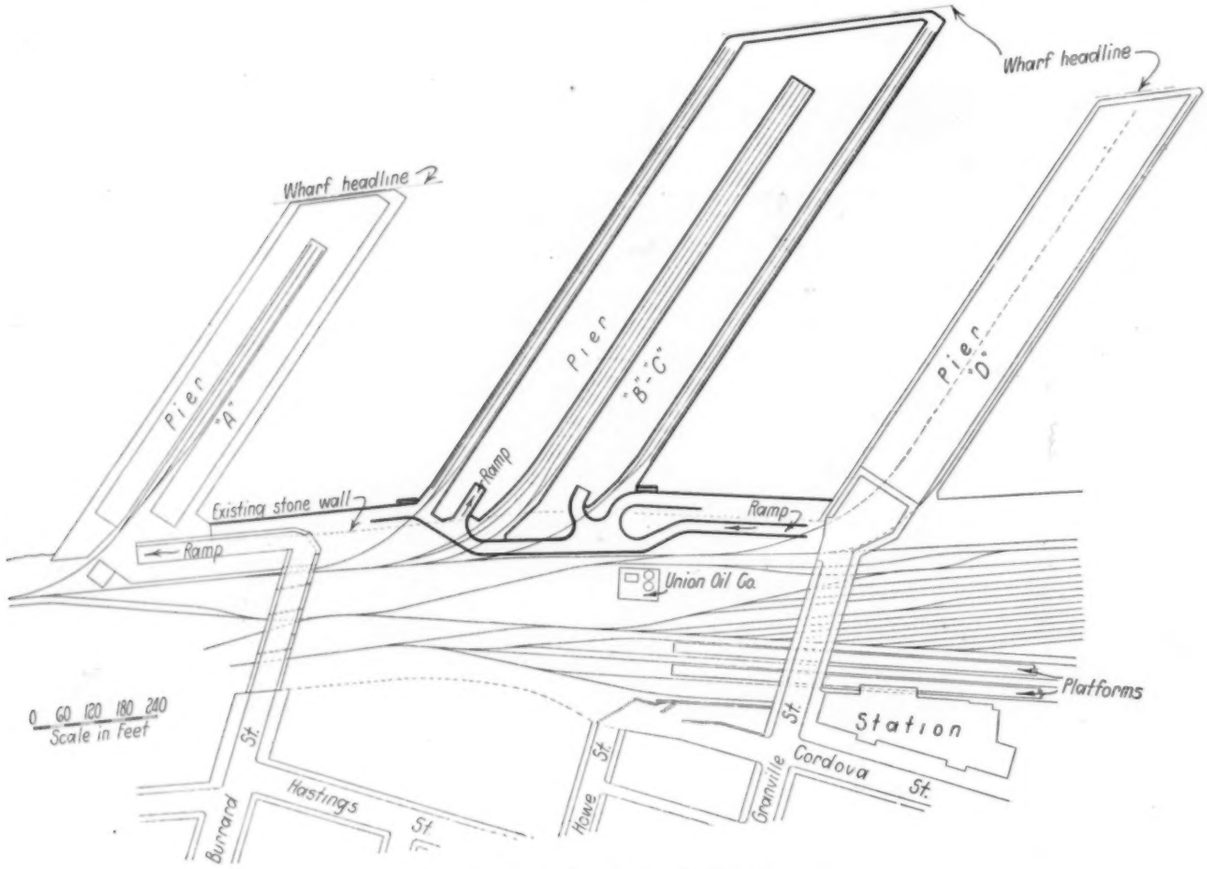
Electric Power and Lighting Circuits

Complete arrangements have been made for general services such as electricity, oil, water and fire protection. Three-phase electric power will be supplied at 2,200 volts to two transformer stations situated in vaults under the deck of the pier, one at each end, and 1/0, 3-conductor armored cable will be used for transmitting current power to these stations and also for connecting the

stations together, thus completing a ring system of feed in which any section of the cable can be cut out without interrupting the service.

The two vaults, of reinforced concrete construction, will consist of two rooms each, one carrying all the 2,200 volt equipment and the other all the 550 and 220-110 volt switching equipment for power and lighting service respectively. The switchboard in this latter room consists of externally operated fused switch boxes mounted directly on the wall. Space has been left near the 550-volt system for the installation of static condensers.

For the operation of the gantry cranes, three-phase trolleys, each sectionalized at two points and fed from the transformer vaults, will be run along the walls on the outside of the sheds over the windows. The marine elevators are operated from these trolley circuits, power



General Plan of Pier and Approaches

plugs being provided at about 100-ft. intervals along the driveways of each shed.

The lighting system will be 220-110 volt grounded neutral with three wire branch circuits, this installation being considerably cheaper than the customary 110 volt circuit two wire system. Ample provision has been made for the artificial lighting of the platforms both inside and outside of the sheds, with switches to permit turning off the lights in the sections or bays in which no work may be in progress. The car space in the central track area will be illuminated by floodlights controlled from the headhouse.

The Oil Supply System

Fuel and Diesel oil systems are being installed on the pier, the plans allowing this pier to be tied in with pier A on the west and pier D on the east. Three 55,000-bbl. fuel oil tanks are located to the west of pier A and supply both A and D with oil through 10-in. mains. Pier B-C will be supplied with fuel oil by a loop main encircling the structure and tied in with the present system so that two vessels in any position at either pier A or pier B-C can be fueled at the same time. A 55,000-bbl. Diesel oil tank is situated beside the fuel oil tanks and a six-inch line from this feeds the pier. Two fuel oil and two Diesel oil outlets are located on each side of the pier, and two fuel outlets and one Diesel outlet on the outer end, six-inch outlets being provided for both fuel and Diesel oil.

Fire Protection

A total of over 5,000 sprinkler heads are being installed for fire protection and are controlled by 22 six-inch dry valves. Indicator post valves are provided to assist in the inspection and maintenance of the sprinkler system. A 10-in. main forms a loop around the pier and connects with two separate sources of the city water supply, while fire boat connection can also be made to this loop. About 50 interior and 7 exterior fire hydrants are located on the pier and will likewise connect with this main. Chemical engines and fire extinguishers will be placed in various positions throughout the pier, and automatic fire alarm and supervisory service will complete the fire fighting equipment. Service water will be provided for supplying the ships with water while they are in dock, fourteen 2½-in. connections being distributed around the pier for this purpose.

The fender system is supported on a line of creosoted piles spaced at five foot intervals around the pier. The

fender beam, composed of laminations of planks, is bolted to these piles and double coil compression springs are spread 10 ft. apart between this beam and the concrete deck structure. The springs are 1⅝ and 1 in. in diameter, and compress four inches under a pressure of 30,000 lb., transferring the impact of colliding forces directly to the concrete structure of the pier itself. Floating fender logs three to four feet in diameter are placed outside the fender line.

Advantages of Concrete Pile Substructure

Numerous factors were considered before choosing a concrete pile substructure for pier B-C. Piers A and D are of creosoted pile construction but an estimate made in 1923 showed that the cost of creosoted lumber and piling had so increased since 1917 when pier D was built, that on a basis of a 20-year life for a creosoted pile substructure and a 40-year life for a reinforced concrete substructure, with interest at 5 per cent and considering insurance and maintenance charges, the concrete construction was cheaper.

Before deciding on the final design, numerous types of concrete substructures were investigated. Borings made on the site of the proposed pier showed hardpan or sandstone shale 60 ft. below high water at the shore end of the pier, sloping downward to a depth of about 200 ft. at the outward end, 1,200 ft. from the shore line. Above the hardpan was firm white clay with some layers of sand and boulders towards the top, to a total thickness of about 100 ft. at the outboard end, and 35 ft. at the shore end. Above this firm clay was about 40 ft. of soft clay and mud.

It was thought advisable to excavate as much as possible of the underlying mud before placing the fill. Accordingly, in 1919, some 620,000 cu. yds. of soft mud were removed from the site of the pier, and about 843,000 cu. yds. of gravel fill had been placed when work was temporarily discontinued. Work was again resumed in 1923 and the fill was completed by the placing of an additional 530,000 cu. yds. of gravel. The material for this fill was obtained by dredging in the First Narrows at the entrance to Vancouver harbor and consisted of sand and coarse gravel. The material was deposited in the water from dump scows and took a natural slope of about 2½ to 1. The center of the fill was raised to the required grade above high water by overcasting with a clamshell.

Method of Handling Concrete Work

The sand and gravel used for the concrete was of glacial origin and was obtained from fresh water bars about 50 miles above the mouth of the Fraser river. It was transported to the pier in scows and unloaded by means of a stiffleg derrick to bunkers located at the shore end of the structure. At the bunkers the aggregate, in proper proportions for a concrete mix, was placed in buckets, each bucket holding sufficient for one charge of the concrete mixer. Two flat cars containing 20 buckets each were used to keep the concrete mixer constantly supplied with aggregate,—the flat cars being hauled to and from the mixer by seven-ton Plymouth gasoline locomotives. The mixing plant was a combination mixing and chuting unit, mounted on a flat car so that it could be moved easily to any part of the work, and the concrete was deposited directly in the forms from the mixer, thus avoiding any liability of separation of the aggregate.

The piles were cast in a yard at the shore end of the pier, where the available space was limited. The piles were cast horizontally with a distance between them equal to the width of a pile, so that when the forms were removed it was possible to cast another set of piles in the spaces between the first set, grease separating the piles. A platform was then placed over these piles and another tier was constructed over the first tier. In this manner, the piles were cast three and four tiers high.

In pouring the piles in the pile yard, a 40 ft. tower with an Insley chute was located on the front end of the car, but in pouring the deck a 75 ft. tower was substituted in order to reach all parts from the central tracks. The mixer was mounted immediately behind the tower and was of ¾ cu. yd. capacity. A small derrick placed in the center of the car was used to dump the aggregate into the mixer from the buckets brought alongside of the car on another track, while a hoist located at the rear end of the car operated a concrete hoisting dump in the tower and also a small derrick in the center of the car. Cement was brought up to the rear of the mixer in box cars and a belt conveyor on the offside of the mixer car was used to transport the cement from the box cars to the mixer. With this plant, about 150 cu. yds. of concrete could be poured in an eight-hour shift. During cold weather the aggregate was heated in the buckets by means of steam jets, steam being obtained from a small donkey boiler placed on a flat car just ahead of the mixer car.

Tests of Concrete

The fineness modulus of the gravel used averaged from 7 to 7.5 and the sand from 2.5 to 3, the fineness modulus of the combined aggregate averaging 6.0. Concrete for the piles was made in the proportion of one part of cement to four parts, by volume, of aggregate,—this mix generally approximating a proportion of 1 to 5¼ by weight. Four test cylinders, 6 in. in diameter by 12 in. long, were made each day, two of which were cured in the laboratory and two placed alongside of the piles to cure in the field, the cylinders being tested to failure after 28 days. The results of these tests for a typical month, that of July, 1925, will give an idea of the strength of the concrete used in the piles. In this month 88 test cylinders, half being cured in the laboratory and half in the field, were tested with the following results:

44 cylinders cured in laboratory:
Average ultimate strength 28 days—44 cylinders 4560 lb. per sq. in.
Average ultimate strength for highest five, 5415 lb. per sq. in.
Average ultimate strength for lowest five, 3780 lb. per sq. in.
44 cylinders cured in field:
Average ultimate strength 28 days—44 cylinders 3825 lb. per sq. in.
Average ultimate strength for highest five, 4570 lb. per sq. in.
Average ultimate strength for lowest five, 3145 lb. per sq. in.

In this connection, it might be well to point out that the results of such tests will vary considerably with the manner in which the specimens are headed up before they are placed in the testing machine.

Before being transported, the piles were allowed to cure at least 40 days. No pile was driven until the test specimen showed a strength of at least 3,000 lb. per sq. in. The piles were picked up by means of a 40-ton locomotive crane, placed on flat cars and run under a large stiffleg derrick erected on a jetty wharf, which transferred the piles from the flat cars to scows. Both the skid driver and the floating driver were supplied with piles by scows. The amount of reinforcing in the piles varied with the size and length. In the largest piles eight 1¼-in. diameter plain bars were used,—the four corner pieces extending the full length of the pile. A two point suspension was used and the reinforcing was made strong enough to withstand this.

The smaller piles were driven without jetting, but

where jests were used, both inside and outside systems of jetting were employed. For the outside jets, four-inch pipes were shoved down on opposite sides of the pile, the tips of these pipes being fitted with cast steel nozzles which discharged about one-third of the water vertically downward, while the other two-thirds was discharged in an upward direction. Considerable difficulty was experienced in keeping the points of these jets at the proper place at the bottom of the pile, and also with a tendency of the pile to run off line. The piles equipped for internal jetting had a 4-in. diameter channel cast along the axis of the pile from the toe to a point where connection was made to the jetting hose, and a special nozzle was cast in the toe of the pile, which forced the water to flow vertically up to the sides of each face as well as down into the fill.

The piles employed vary from 15 in. to 23 in. square in section and from 20 ft. to 73 ft. in length. A total of about 6,000 piles was required, of which about one-half were driven with a skid driver, employing either a No. 0 Union steam hammer or a No. 1 Vulcan hammer, the Vulcan hammer having been remodelled to fit the same size leads as the Union hammer. The remainder of the piles were driven by the floating pile driver "Tarzan II," which employs a No. 00 Union hammer.

Driving the Concrete Piles

The gravel, due to its character and to having been deposited through water, had settled most compactly so that in the beginning considerable difficulty was experienced in driving piles into the fill without damaging them. The piles were driven with a cast steel follower four feet long, into which projected the reinforcing bars which extended above the head of the pile. On the top of this follower there was the usual recess holding the customary hardwood cushion block. Under the hard driving experienced this cushion block wore down rapidly, allowing the hammer to strike on the edges of the follower, seriously jarring both the hammer and the follower. This difficulty was overcome by doing away with the hardwood cushion block, filling the recess in the follower head with steel plates and placing on the top of the steel plates a two-inch piece of western spruce to take the blow of the hammer. These two-inch pieces of spruce did not last long, but it required very little time to slip in a new piece of spruce as soon as the old one was demolished.

After some experimenting, the piles were formed with a small point and a long taper. The blow of the hammer was carefully adjusted and great care was taken that the floating driver did not move on its spuds while the pile was in the leads. Under these conditions it was found that practically no cracks appeared in the piles. After the pile was driven it was carefully inspected from the top to the ground line by divers, who had no difficulty in seeing cracks under water, although they usually appeared as very fine lines. In a few cases the edges of the crack spalled off. Of the 6,000 piles driven, very few were found to be cracked, and of those cracked, two-thirds were driven during the experimental stage of the driving. Cracks which occurred above low water were repaired by chipping a groove along the crack and then shooting on a heavy coat of Gunite. It was not believed probable that deterioration would result from hair cracks below low water; nevertheless to avoid any possibility of such deterioration, all the cracks below low water were also repaired. This was done by clamping a cylindrical steel box four feet long around the pile, centering on the crack, placing wire mesh reinforcing inside the box, stopping all cracks by divers, and then pouring a five-inch shell of concrete around the pile.

Testing the Density of the Concrete

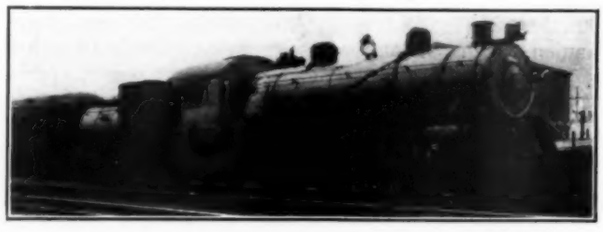
To avoid deterioration in seawater it is important that the concrete used in the piles be dense. To test the permeability of the concrete, pieces were broken off some of the piles after they had been cured. These pieces were clamped over the end of a water pipe and were then subjected to a water pressure of 115 lb. per sq. in., for 24 hours. Although some of the pieces were less than ½ in. thick there was no sign of any water being forced through them.

Due to the large number of ships which now use fuel oil, there is always a certain amount of this oil floating on the surface of the water. Within a few weeks after the piles were driven at pier B-C, they were covered with a film of fuel oil from low water mark to high water mark. It appears probable that this film of oil will protect the surface of the piles in that it will prevent alternate wetting and drying of the concrete which has been found to be one of the principal causes of disintegration.

Two separate tests were made to determine the bearing value of concrete piles driven into this gravel fill. A 15-in. by 15-in. pile, 30 ft. long, was driven to a penetration of 27 ft. 9 in., using the No. 0 Union hammer with steam pressure of 90 lb., the penetration amounting to 10 in. in the last 50 blows. This pile was loaded to 52 tons and showed no settlement. Two 17-in. by 17-in. piles 47 ft. long were also driven with the same No. 0 Union hammer, one to a penetration of 15 ft. 6 in., the movement in the last 50 blows being 1½ in., and the other to a penetration of 14 ft. 3 in., the movement in the last 50 blows being 5 in. A load of 86 tons was placed on each of these piles and left for a period of five weeks. No settlement appeared in either of these piles.

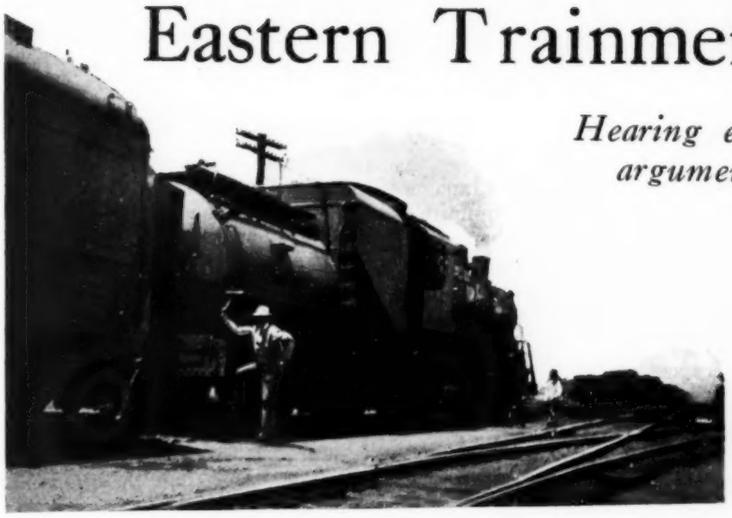
The pier was designed and built by the Sydney E. Junkins Company, Ltd., under the direction, and with the co-operation of officers of the Canadian Pacific.

Upon Recommendation of the Interstate Commerce Commission, the President has posthumously awarded a medal of honor to Alexander Dunn of Gaithersburg, Md., a flagman of the Baltimore & Ohio, who, on February 8, 1926, in an endeavor to save the life of a 10-year old boy at Takoma Park, D. C., lost his own life. When train No. 57 westbound had passed the boy came across the track behind it onto the eastbound track in front of the Capitol Limited express, which was traveling at a speed of about 50 miles an hour. In an effort to save the boy the flagman made a lunge for him. They were both struck and instantly killed. This is the twenty-sixth medal of this character which has been awarded since the enactment of the Medal of Honor Act in 1905.



Erie Locomotive 2531, the "Harvey Springstead," Named from Its Engineman—in Suburban Service Out of Jersey City

Eastern Trainmen's Wage Case



Hearing ends following summary and argument—Board goes into session

BOTH parties to the case involving a request for an increase in pay amounting to approximately 20 per cent for conductors and trainmen on eastern railroads, as well as changes in rules, completed their arguments and submitted their case to the board of arbitration, which went into executive session November 15, at New York. The board is expected to issue its opinion as to the merits of the case within ten days or two weeks, but has until December 12 to consider the case.

J. G. Walber, vice-president of the New York Central, further to clear up the position of the carriers in regard to their ability to pay the increase asked by the men, and to straighten out misinterpretations of Mr. Ekin's testimony with regard to the eastern roads, referred to pages 674 and 675 of the record. This part of the testimony, to which Mr. Walber particularly referred, was covered in the *Railway Age*, November 13, page 942, The record on this point reads as follows:

Mr. Doak: . . . Do you think the ability or inability of the carriers to pay is a contributing or a controlling factor in fixing wage rates?

Mr. Walber: Not the controlling factor, but it should be taken into consideration.

Mr. Doak: You do not seem to present on behalf of the Eastern Railways any argument that they are not able to pay.

Mr. Walber: We have not done so.

Mr. Doak: I am glad you have not.

Mr. Walber: No; we have not done so.

Mr. Doak: I got from a witness you had on the stand that that probably was a condition—Mr. Ekin.

Mr. Walber: No; he made no such contention, if you will read his testimony.

Mr. Doak: He made some comparisons, however, that seemed to drift that way.

Mr. Walber: His argument was, and I think it is demonstrated, that he did not believe any wage increases could be justified.

Mr. Doak: I am aware of the fact he made that statement, but as one of the contributing factors I understood him to bring in these other questions. Mr. Walber, has not the business for 1926, in your opinion, greatly exceeded that of almost any other year in this territory?

Mr. Walber: Since I have been in this conference committee, I have not been able to follow those things as closely as I do usually, but I do get the impression from newspaper articles that 1926 so far is better than 1925, but those figures are for the United States as a whole. I have not seen figures for the eastern region by itself. We know, of course, that there are extraordinary conditions in other sections of the country. We know, for instance, about this British coal we have talked about, and we know that is a very important element in the increase in business in the Pocahontas region. We know also there has been a revival of business in the southwest section of this country, and just how the conditions in the different parts of the United States will account for the increase in the gross business or the reduced operating expenses and increases in the net, in the eastern territory, I have not seen any figures to base any evidence on or any ideas on, and before I would want to answer your question I would want to confine it to the eastern territory, which is the territory of the United States involved in these arbitration proceedings.

Mr. Doak: Desiring to add my most hearty approval to the increases in earnings and the increases in business which the carriers are getting I am just wondering if you do not think that the employees should have their share along with the carriers.

Mr. Walber: I do, and we go further and try to show that they have been getting it and show our belief in that idea, Mr. Doak. That is one reason we went into that—to satisfy ourselves that the employees were getting a fair share.

W. N. Doak Argues for Men

In summing up the case for the men, W. N. Doak, vice-president of the Brotherhood of Railway Trainmen, contended that the employees were entitled to the increased wages asked on the ground of increased productivity and the general prosperity of the railroads. He said that in 1917 the train and yard service employees put in 514,672,000 service-hours, while in 1925 they handled the business of the country with only 417,853,000 hours. At the same time, he pointed out, the men produced 723,076,940 more freight train-miles and 735,769,550 more passenger train-miles in this period. He continued as follows:

The revenue freight ton-miles handled per employee rose from 214,667 in 1921 to 264,152 in 1926, or an increase of 49,485. The average number of employees decreased from 1,869,501 in 1921 to 1,782,733 in 1926, or a decrease of 126,768 in a five year period, while the number of loaded cars increased from 42,322,670 to 51,916,798 or an increase of 8,594,128, and the average train-load in tons increased from 687 in 1921 to 752 in 1926, or an increase of 65 tons. In 1920 the total number of employees was 1,999,000 as compared with 1,783,000 in 1925, or a decrease of 216,000 employees, while the operating revenues of the carriers increased from $2,747,000,000 in 1920 to $2,754,000,000 in 1925, or an increase of $7,000,000, while the compensation for conductors, brakemen, flagmen, baggagemen and helpers in passenger, freight and yard service decreased from $240,000,000 in 1920 to $201,000,000 in 1925, or a decrease in total compensation of the classes represented by us of $39,000,000. Many other instances to prove increased productivity could be cited, but we believe this is sufficient to show that the increased productivity of our men alone would justify more than the increases we have requested.

Considerable testimony has been presented dealing with the fact that men are away from home a great deal of their time and that they must of necessity work on Sundays and holidays and that night work must be done by train and yard service men. These factors are of the greatest importance in the adjustment of the wages of train and yard service men. No other class of employees, with but few, if any, exceptions, are expected to be away from their homes on their employer's business without being given remuneration for away-from-home expenses, yet our train service employees are required to be away from home a very large amount of their time and no allowances are made for away-from-home expenses. In this connection, we have had testimony which showed that the away-from-home expenses range from one dollar to three dollars per day or round trip. While we have not asked for a specific allowance for away-from-home expenses, we would have you bear in mind that provisions must be made in compensation rates in order to overcome this difference in wage rates between railroad employees generally and employees in other occupations who either do not

go away from home or who are given away-from-home expense allowance.

Expense Away-from-Home Factor

The presentation of the carriers for combined earnings, extra miles, overtime, and the few other allowances which accrue to train service men do not produce enough money adequately to take care of the away-from-home expenses of these men. For instance, the average combined earnings shown by the carriers for a passenger brakeman in through service for the month of October, 1925, of $6.70 per trip certainly do not compensate these men for their away-from-home expenses on many of the runs and leave them anything to protect their families and homes. The minimum paid men on such runs would only receive $5 per day and in many instances only make the minimum day's pay each day and are away from home every other night and have most of their meals away from home every other day. The presentation of the carriers shows that through freight brakemen averaged $6.72 per trip during the month of October, 1925, which was the equivalent of more than 11 hours.

Very few, if any, classes of employees are entrusted with so much valuable property and safety of so many people as our train and yard service men. No occupation, trade or calling exacts such accurate, careful and faithful service as is expected and required of railroad men in our classes. Nothing in our industrial life means so much as accurate, careful handling of railroad trains. These factors, then, should be considered as germane and proper in the adjustment of wage rates for these men.

Gives Figures on Wages

Despite the submission as to the average rates of pay on certain runs, grouped to the best advantage by the carriers' representatives to show high average earnings, the fact remains undisputed that as a whole train and yard service men do not make excessive earnings. Even when all overtime and special allowances, including excess miles and hours, are considered, in the year 1917, after the eight-hour day became effective for train and yard service men, we find the average yearly compensation for road freight conductors was $1,855 and in 1925 was $2,762, or an increase of $907. Road freight brakemen and flagmen averaged $1,202 in 1917, and in 1925 $2,073 or an average annual increase of $871. Passenger conductors averaged $1,966 in 1917 and in 1925 averaged $2,944, or an increase of $978. Passenger baggagemen averaged $1,175 in 1917 and $2,213 in 1925, or an average increase of $1,038. Road passenger brakemen and flagmen were increased on an average of from $1,094 to $2,093 in this same period, a total average increase of $999. Yard conductors or foremen were increased from $1,585 in 1917 to $2,384 in 1925, an increase of $799. Yard brakemen or helpers were increased from $1,327 to $2,028, or a total average of $701 in this same period. Switch tenders were increased from $846 to $1,663 in this period, or $817.

Please bear in mind that these figures refer to the total actual earnings, including wages, overtime, and all special allowances. The total average increase for all the train and yard service employees in our classifications was from $1,382 in 1917 to $2,216 in 1925 or an increase of $834—just sixty per cent.

Mr. Doak next made comparisons of the earnings of the train service employees with men in other than railroad work with the purpose of making the point that the pay of men in other work was better and had increased at a better rate than pay of men in train service.

L. E. Sheppard, president of the Order of Railway Conductors, made an argumentary submission to the board along similar lines. He said that the board was asked to measure the compensation of the men in accordance with the hazard of employment, the training and skill required of them in the performance of their work, and the degree of responsibility and the character and regularity of employment. He said that the board was requested to take note of the fact that the productivity and the value of the conductor's services were greater than ever before; also that the conductor, while having a wage schedule which fixed a higher basic wage than ever before, except for a limited period, was contributing in a greater degree to railroad efficiency by handling more tonnage, running more miles and making less hours, but in doing so was effecting only slight increases in the basic wage. He emphasized the facts that men were away from home a good share of the time, were in a comparatively hazardous occupation, and had to do night work, but were paid comparatively less than men in other occupations.

Mr. Walber Speaks for Roads

J. G. Walber, as chairman of the Conference Committee of Managers, said that the position of the Conference Committee of Managers has been from the beginning that in disposing of such wage requests as are involved in this proceeding, exceptional or purely local conditions are not an adequate gage for reaching proper conclusions. These propositions apply alike to all railroads included in the agreement to arbitrate, regardless of the character of the passenger service, whether through or local, high speed or slow speed; in through freight service regardless of whether the trains are operated at high speeds, slow speeds, or whether the trains are operated with mileage in excess of the minimum day, equaling the minimum day, or less than the minimum day.

Commenting on the subject of rates of pay in outside industries Mr. Walber stated:

The employees submitted exhibits comparing their basic day rates with the hourly and daily rates of employees in outside industries. The employees included in the exhibits consist principally of building trades, employees in the bituminous mines, granite cutters, employees in the printing trades, bakers and others. The employees claim that these rates are obtained from the United States Department of Labor, and that they do not include in their reports any rates except those negotiated with unions.

As shown by testimony of witness McClees (E. J. McClees, secretary, Bureau of Information of the Eastern Railways), the reports of the United States Department of Labor include many other classes of employees than those selected by the railroad employees for their exhibits. In Monthly Labor Review, Bulletin No. 6 of December, 1925, on page 65, additional occupations are shown, many of which have rates far below those that the employees selected, as is evidenced by the average earnings per week and the full-time hours per week.

The plain fact is that, at no time has any tribunal been willing to consider the rates of pay in the building trades and mines as any evidence as to what wages should be paid railroad employees.

Similar testimony was offered in the eastern arbitration proceedings of 1913 and that board completely disregarded such rates. Similar contentions were made in the hearings before the Board of Railroad Wages and Working Conditions, and they could find no comparability between other occupations and those in the engine and train service. The U. S. Railroad Labor Board had before it similar outside industry rates. In its decision No. 1983 it stated:

Insofar as the building trades are concerned, they furnish no safe criterion at this time by which one can be guided in the fixing of wages for railway employees. The accumulated housing shortage, which followed the building inactivity of the war period, has resulted in highly artificial conditions in that industry. * * *

Wages on Building Trades

It is a well known fact that in large centers like New York, Boston and Chicago, wages for the building trades have continued to advance since 1923. The shortage in housing is decreasing and there are some indications of recessions in rents. It is evident that the owners of these buildings seem to be helpless as to costs and are transferring such costs to the users. Railroads are not in a position to pass the costs on to their users, their charges to the public being regulated by national and state commissions.

Our position with respect to these rates in outside industries is that the conditions under which these rates produce earnings are entirely dissimilar from the conditions under which the rates for these employees produce their earnings.

In his conclusion Mr. Walber said:

It is a well known fact that economical operation depends in great measure upon an even flow of traffic, free from disturbing influences, and the witness (Mr. Ekin) developed the fact that a falling off in traffic of only 5 per cent would reduce revenues $137,500,000, or $43,705,000 more than the average surplus during the five years 1921-1925, inclusive.

Sufficient to say that notwithstanding the increase in transportation of higher rated commodities, there has been a constant decline in rates both passenger and freight.

The reduction in rates 1925 compared with 1921, when applied to traffic of 1925 being equal to—

Freight	$244,117,679
Passenger	13,566,805
Total	$257,684,484

or the reduction in wages paid the railroads for their service in 1925 as compared with 1921. This fact must be considered in connection with the constantly increasing competition from automobile, bus and trucks, affecting both freight and passenger traffic.

This request is upon railroads as a whole; not those alone who for the time being might appear to be able to meet a small portion of the demand, but upon those who for years have not been able to pay any dividends and at the present time are not earning a return on their common stock. These railroads are just as necessary to their communities as are the railroads who are earning returns corresponding with, or approaching, the rate fixed by the Interstate Commerce Commission.

The Interstate Commerce Commission has decided that rates shall be fixed so that they shall return in the aggregate 5¾ per cent for a given rate making district and that under the law individual carriers are entitled to retain 6 per cent if earned before any recapture takes effect. One of the representatives of the employees stated that in his opinion, 5¾ per cent was not sufficient; still after years of adversity when some of the roads in this district barely earned their fixed charges and when very few earned the 5¾ per cent, and while the carriers in the eastern district in the aggregate did not earn 5 per cent in 1925, they are now being asked to increase the wages of these employees.

Ton-Mile Earnings Decrease

The testimony shows the effect of a comparatively slight recession in business on the earnings of the carriers; it also shows that the earnings per ton per mile are gradually and steadily decreasing.

There is continuing pressure from the public for further reductions in freight rates and passenger fares.

Consideration of all the circumstances involved in this case, the high earnings which these employees are now receiving, and particularly the preferred position of conductors and trainmen as related to other classes of employees, forces the conclusion that no increases in the rates of pay of these classes of employees can be justified.

Mr. Walber pointed out that if the wage increase asked, if granted, would amount to an increased pay roll for the eastern railroads of $38,000,000 annually. He said that the rates and rules had been asked to become effective, retroactively, as of January 1, 1926, and that the Conference Committee could not support such an arrangement and insisted that no provisions of the board of arbitration's decision be made effective prior to the date of the decision.

N. I. T. League Meets at New York

A RESOLUTION directing the legislative committee to make a careful and thorough investigation of the transportation act with regard to powers and functions of the Interstate Commerce Commission with a view to learning what, if any, changes should be made in the powers, or whether a decentralization of the powers of the commission would be advisable, was adopted by the National Industrial Traffic League at its opening session of the annual meeting in New York, November 17. The resolution came about, not as it was pointed out, as a reflection on the Commission, nor a criticism of it, but as the result of a communication from Homer Hoch, member of the House committee on Interstate Commerce, to the executive committee of the league, pointing out that the commission was overburdened with work, and should be relieved, and further, was not in a position perfectly to appreciate the local points of view involved in a great many transportation controversies. It was reported to be Mr. Hoch's position that the state commissions should have more power, and that the Supreme Court had gone further than was necessary in taking away power from those bodies. The effect of the resolution will be that a study will be made in effort to determine the advisability of any change in the present procedure.

Another resolution was passed which condemned the enlisting of support of public officials in favor or against proceedings before the commission, and reads as follows:

WHEREAS Congress has created the Interstate Commerce Commission as a quasi-judicial body with authority to determine controversies between carriers and shippers engaged in interstate commerce, and to regulate the level and the relative adjustment of freight rates, thereby frequently involving the adjudication of issues between contending communities and shipping interests; and

WHEREAS there has been manifested a tendency to invoke the assistance of members of Congress and other public officials of the Federal government in advocating or opposing, before the commission, contentions involved in cases pending before that body for determination; and

WHEREAS the manifestation of such a tendency is calculated to give the appearance to the public that political or outside influences are to be taken into consideration by the commission in adjudicating such controversies;

WHEREAS, such efforts to secure such support very often places the official approached in the unhappy position of either appearing to criticize the commission appointed to solve such problems, or of refusing the request of influential constituents;

THEREFORE BE IT RESOLVED that The National Industrial Traffic League does hereby condemn and deplore all efforts made by any parties to proceedings before the commission to enlist the support or assistance of any such public officials in favor of, or in opposition to, contentions in issue in proceedings pending before that body.

The league went on record as taking the position that commission was in need of more help in carrying on its work, and that, in view of the fact that there was a possibility the budget to cover commission expense might be reduced, the League would continue its budget committee and direct it to submit a report seeking to have the budget for the commission increased. It was voted to consider further the use of a uniform telegraph code in communication between shippers and the railroads, and it was reported that a code had been developed during the war period, but in transmitting it through the mails, the only copy was lost. The report of the executive committee with regard to recodification of the navigation laws of the United States was approved. The report pointed out that no changes were to be made in the laws, except that they would be restated and the matter, therefore, was something for admiralty lawyers to handle.

The officers for the coming year, as reported by the nominating committee, will be as follows: president, C. E. Childe, manager of the traffic bureau of the Omaha Chamber of Commerce; vice president, W. H. Day, of Boston; and E. C. Wilmore, treasurer, traffic manager of the Sefton Manufacturing Corporation, Chicago. It was voted to hold the next annual meeting in Chicago, November 17.

The League approved the bill of lading committee's report except with respect to the "no recourse" clause, a part of the report on which it was decided to confer with the commission before taking any further action. The report took the position that no action should be taken urging the carriers to adopt carbonized bill of lading forms, because they resulted in smearing of papers and made necessary printing of terms and conditions in type not sufficiently noticeable. With respect to legislation on transportation matters, the position was taken that there was not likely to be "any great political agita-

tion with respect to transportation legislation unless it should be brought about by reason of conditions involved in the valuation of the railroads for rate-making purposes and in the administration of section 15a." With respect to section 15a, it was stated that the League should get behind the movement to reduce the provisions of the section to a simple declaration that the carriers are entitled to the opportunity to earn a reasonable and fair return upon the value of their properties devoted to public use. Opposition to such measures as S4110, requiring the carriers to obtain affirmative permission of the commission before increasing rates, was reaffirmed. Opposition was expressed to the Senate Resolution 173, proposing a general investigation of the rate structure of country, by the Senate committee on interstate commerce. The report of the transportation instrumentalities committee was approved. It urged that every member lend his aid toward the establishment of landing fields and town markers in his locality and the encouragement of the use of air mail service when practical.

With regard to the nominations for officers for the coming year, the secretary was instructed to cast a unanimous vote for those reported. Approximately 300 members and guests attended the meeting.

Examiner Recommends Against Lease of B. R. & P.

WASHINGTON, D. C.

A PROPOSED report by Examiner O. D. Weed, recommending a finding by the Interstate Commerce Commission that the acquisition of control of the Buffalo, Rochester & Pittsburgh by the Delaware & Hudson would not be in the public interest, was made public by the commission on November 16 and at the same time the case was assigned for oral argument before the commission at Washington on December 21.

"The fact that the lines of the applicant and the lessor are so far apart," the report says, "and the absence of evidence that the applicant can exercise control over any of the existing lines between them, militate against the proposed acquisition of control being viewed as in the public interest, and, in the opinion of the examiner, make it requisite that more preponderant evidence of public interest be shown than would be necessary if the lines were contiguous.

"It is recommended that the application be denied without prejudice to resubmission at such time as it may be shown that a plan has been promulgated for the formation of a combination of carriers that will include a connecting link between the line of the applicant and that of the lessor; with the proviso, however, that such disposition of the application is not to be construed as indicating the commission's views regarding the final disposition of the lessor's line."

The report points out that the only connection between the lines of the two companies is over the lines of other carriers, the distances being about 158 miles by the Delaware, Lackawanna & Western, 163 miles by the Lehigh Valley, 198 miles by the Erie, and 211 miles by the New York Central. The control sought, the examiner says, by itself would not add anything to the traffic routes now in existence and their greatly increased use "seems doubtful."

Referring to the claim of the applicant that the proposed lease may well be a step in the formation of a new trunk line, the main stem of which might be formed by the Wabash with the Delaware, Lackawanna & Western or the Lehigh Valley, or with the Erie if the Nickel Plate combination proposed some time ago does not include the Erie, the report says that "a plan should be promulgated for the complete formation of a new trunk line before the acquisition herein sought is urged as a step towards the formation of such a trunk line."

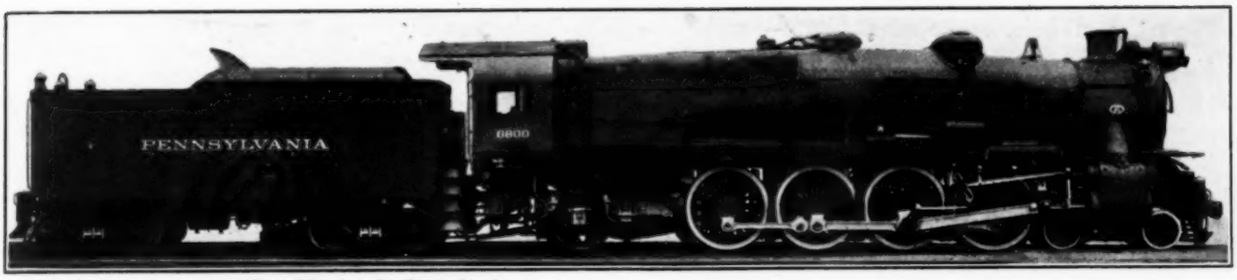
Another point urged by the applicants in favor of the lease was that it would preserve the integrity of the lessor, whereas the Baltimore & Ohio and New York Central have been considering the division of its lines between them, but the examiner says that this can hardly be recognized as an issue in this proceeding as no proposition for the segregation of sections is now made.

The New York Central presented no testimony in opposition to the lease, but argued in its brief that no public interest will be served by such acquisition because the lines are not connected and because there is little interchange of traffic between them. The Baltimore & Ohio had opposed the lease, pointing to its close relations with the Buffalo, Rochester & Pittsburgh and urging the advantages to both roads and to the public of a more intimate connection.

Referring to the Baltimore & Ohio's plans for the formation of a new through line between Chicago and New York, which contemplates the inclusion of about 80 miles of the B. R. & P. line between Butler and Dubois, Pa., the examiner says: "These representations made by the Baltimore & Ohio are important. Although its acquisition of lessor's line is not an issue herein, consideration may properly be given to them, looking forward to the ultimate disposition to be made of that line in connection with the formation of a new group or the enlargement of an existing group of carriers.

Under the proposed lease for 999 years, the Delaware & Hudson would pay annually a sum equal to 6 per cent on the $6,000,000 of preferred stock and $10,500,000 of common stock as well as interest and other charges and expenses. "It would seem," the report says, "that there must be some improvement in earnings to justify the rent of $990,000 reserved in the proposed lease, although the applicant claims that the economies to result from the combined operation of both lines would be such as to justify the proposed rental. * * * As above noted the lease provides for the payment of a fixed dividend charge that is larger than the annual dividend distribution made by the lessor for several years, and larger than its average annual net income for the last decade. It is doubtful whether this substitution of a fixed for a contingent charge is in the public interest. It certainly indicates the advisability of more careful scrutiny than would be required if the plan merely provided for an exchange of stock of the lessor for that of the applicant." The testimony in which the applicant claimed that the common control, management and operation of the two lines would result in important economies and increased operating efficiency is reviewed and the examiner says that while some economies would doubtless result "it may well be doubted that they would amount to as much as the applicant anticipates, particularly in view of the distance between the two lines."

"The contemplated union of the two lines would not restrict competition in any way," he says, "as the applicant and the lessor do not compete. On the contrary, applicant claims that the acquisition by it of the lessor's road would increase competition between the united lines and other railroads. * * * Acquisition by applicant of control of the lessor's lines would probably increase to some extent the interchange of commodities between the two roads and thus perhaps increase the competition with other roads. That such increase of interchange would be very great may, however, well be doubted."

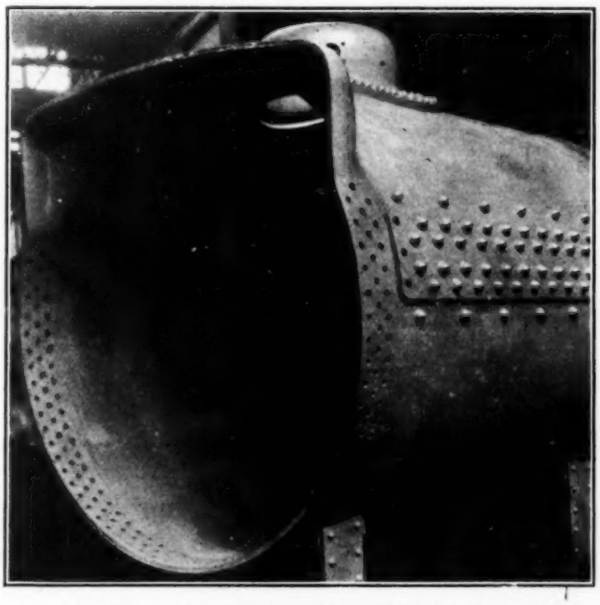


Mountain Type Locomotive, Class M1, for the Pennsylvania

Mountain Type Locomotives for the Pennsylvania

For heavy passenger and fast freight service— 72-in. drivers—Tractive force 64,550 *lb.*

IN 1923 the Pennsylvania built at its Juniata shops, Altoona, Pa., a 4-8-2 type locomotive which was notable because of its high capacity and unusual details of construction. In accordance with the Pennsylvania's policy, this locomotive was subjected to a series of exacting tests both on the road and at the Altoona test plant, before any additional units of the same class were ordered. After the locomotive had proved itself fitted for the service requirements, orders were placed with the Baldwin Locomotive Works for 175 and with the Lima Locomotive Works for 25 additional locomotives of the same type. These locomotives are designated by the railroad company as Class M 1, and are now being placed in service. They were designed by the motive power department of the Pennsylvania under the supervision of J. T. Wallis, chief of motive power. They are intended for heavy passenger service, for which reason the driving wheels are 72 in. in diameter, but will also be used for fast freight service, for which the high drawbar pull makes them suitable.



Second Boiler Course Flanged for Belpaire Connection

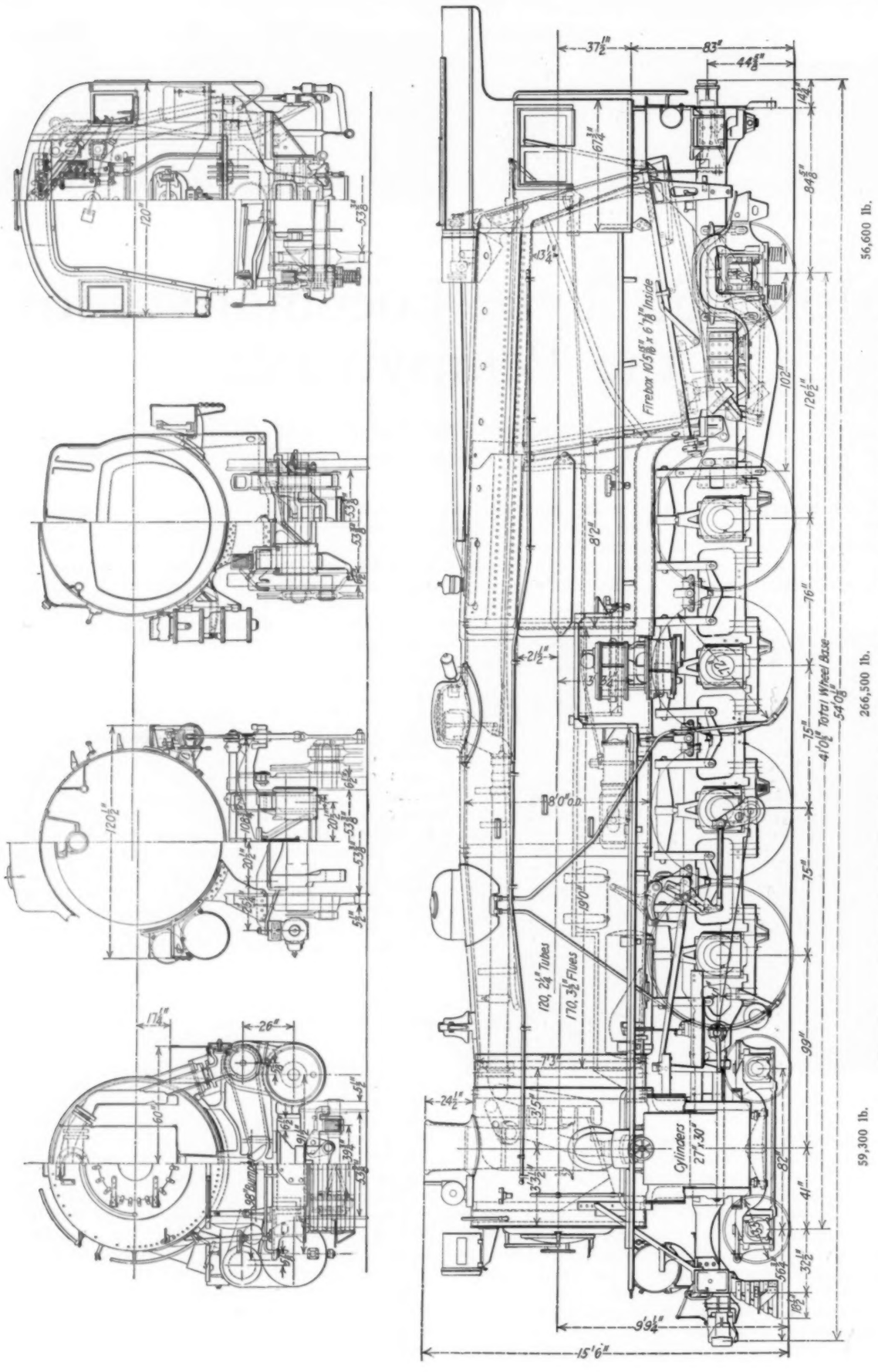
The Class M 1 locomotive develops a tractive force of 64,550 lb. The cylinders have a diameter of 27 in. and a stroke of 30 in. The boiler has a working pressure of 250 lb. per sq. in. With 266,500 lb. on driving wheels, the factor of adhesion is 4.13. This high starting power in combination with a boiler of generous steaming capacity, enables these locomotives to develop large horsepower for sustained periods.

Boiler Is of Unique Construction

In accordance with the Pennsylvania's practice, the boiler of the Class M 1 is of the Belpaire type with tubes of moderate length—19 ft. between the tube sheets. Exclusive of the smokebox, the cylindrical section of the boiler consists of two rings, the first of which is sloped, increasing the outside shell diameter from 84½ in. to 96 in. The dome is placed on the second ring. It is of pressed steel and measures 31 in. in diameter and 13 in. in height. The longitudinal seam on this ring is placed on the right-hand side and after the sheet has been rolled to a circular shape it is flanged on top to form the hip joint connection for the Belpaire firebox.

The combustion chamber in the boiler is 8 ft. 2 in. long and this necessitates the use of a wrapper or outside shell section of corresponding length, having the Belpaire shape and staying. This combustion chamber section of the outside shell is made up of four pieces, namely, a bottom half, which is in one piece with the outside throat sheet; two side pieces and a top piece. The radius of the throat is unusually large being 16 in. at the center, reducing to a small radius at the sides. The outside firebox shell is of three-piece construction, the top and sides being separate.

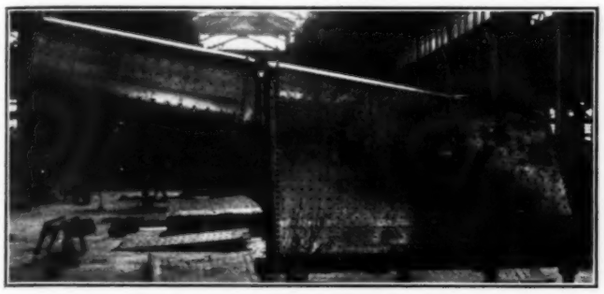
The crown and sides of the firebox are in one piece and the inside throat sheet is in one piece with the lower half of the combustion chamber. The sides and crown of the combustion chamber constitute a separate sheet, which is butt-welded to the lower sheet on each side. The firebox and combustion chamber are united above the welded longitudinal seam by a corrugated plate which constitutes an expansion joint. This plate has riveted seams, except on the short longitudinal side



Elevation and Cross Section Drawings of the Pennsylvania, Class M1, Mountain Type Locomotive

seams which are welded. The corrugation is made with a 2-in. radius and forms a trough about 5 in. deep across the crown sheet. This trough can be cleaned through two wash-out holes, one of which is placed on each side.

The corrugated joint described in the preceding paragraph compensates for expansion and contraction in the upper part of the firebox. To make similar provision for the lower part of the firebox, a crescent shaped corrugation is formed in the front tube sheet below the

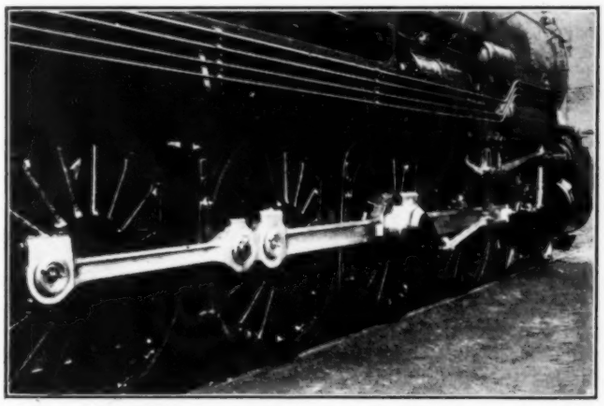


Firebox and Combustion Chamber Complete, Showing the Corrugated Connection

tubes. This corrugation has a maxmium depth at the center of 2 in. The combined length of the firebox and combustion chamber is so great in this design that an arrangement such as has been described is desirable in order to prevent distortion and tube leakage.

The firebox tube sheet and back sheet are riveted in place, but the joint around the door sheet is electrically welded. The flues are welded into the back tube sheet.

These locomotives are fired by mechanical stokers, the Duplex and the duPont Simplex each being used on 100 of these locomotives. The grates are arranged to shake by hand and have transverse drop plates near the front



Side View showing the Rod Arrangement and Valve Motion

end of the firebox. The ash pan has two deep hoppers which are fitted with drop bottoms. These are controlled by levers placed on the left side, under the front end of the firebox.

The two injectors are non-lifting and they feed through checks placed on the back boiler-head. The feed water is conveyed to the front end of the barrel through internal pipes, this arrangement being in accordance with the regular practice of the Pennsylvania. The steam turret is placed outside the cab and receives its steam supply from the highest point in the boiler through an external pipe which connects to the shell near the front end of the combustion chamber roof sheet. The two safety valves are tapped directly into the shell just forward of the steam turret connection.

In addition to the usual gage cocks which are tapped into a water column on the back head of the boiler, there is a second set having pipe connections which terminate over the highest part of the crown sheet. These pipe connections are run through an external pipe which is filled with steam so that condensation is avoided. These gage cocks are placed over the boiler head in the cab. They have extension handles, conveniently located and drain into the drop funnel, so that the discharge can be easily seen by the engineman.

The dome contains a throttle valve with a balancing

The Assembled Frames and Cross Ties

piston from which steam passes to the superheater header through an internal dry pipe, 8½ in. in diameter. The superheater is a type E composed of 170 single loop elements placed in as many 3½-in. flues. The steam distribution is controlled by 12-in. piston valves which are operated by a Walschaert gear and are set with a travel of 7 in. and a lead of 9/32 in. The steam lap is 1 7/16 in. and the exhaust clearance 7/16 in. A power reverse mechanism is applied.

The Running Gear

The machinery details follow the Pennsylvania standard practice which aims at reducing the weight of the parts as far as is consistent with safety by the use of heat treatment and careful designing. The crossheads are of the underhung type, working in box shaped guides which have two inwardly projecting longitudinal ribs on each side in order to provide liberal bearing area. Each guide is made in two pieces, which join on the longitudinal center line and are held together by horizontal bolts. The crosshead bodies are of high test Vanadium steel; while the crosshead pins, piston rods,

crank pins and driving axles are of heat treated carbon steel and are hollow bored. The main and side rods are also heat treated.

Floating bushings are used on the main rod back ends and the main pin bearings on the side rods. Each stub has a horizontal cavity closed by a compression grease plug and communicating with holes drilled through the brass so that the pin can be lubricated.

The main frames are unusually massive as the width throughout the greater part of their length is 7 in. This is increased above the pedestals to 9½ in. by inwardly projecting lugs. Each frame is cast in one piece with a single front rail having a cylinder fit 6½ in. wide and 12 in. deep. The pedestal caps are of ample section and are held in place by three bolts on each end. Back of the rear driving pedestals the frames assume the form of slabs and are bolted to a Commonwealth cradle casting. The pedestal taper is 1½ in. by 18½ in.

The frames are braced transversely, mid-way between adjacent driving axles, by steel castings which are bolted to both the upper and lower frame rails. Intermediate boiler supports in the form of expansion plates are provided at the guide yoke which is just ahead of the leading drivers and also between the second and third pairs of drivers. The front end of the firebox is carried on slidings bearings and the rear end on an expansion plate.

The front truck is of the swing bolster pattern with three-point suspension links, while the rear truck is similar to that used on the Atlantic, Pacific and Mikado type locomotives of the Pennsylvania and formerly known as the KW type. In this design the truck frame itself acts as the rear equalizer and the main locomotive frames are supported directly on it.

In accordance with the railroad company's practice, the driving and rear truck springs are made with a reverse camber when loaded, and flanged tires are used on the front and rear driving wheels only.

Special Equipment

Among the interesting details used on these locomotives may be mentioned the bell ringer which is air operated. When the device is in use the bell itself remains stationary, while the clapper moves. The bell can also be run by hand in the usual way if necessary. The cylinder cocks are steam operated and are controlled from the cab. When the operating valve is open the cocks are closed by steam pressure acting on the plungers. When the steam pressure is released, the plungers are moved upward by spring pressure and the cocks open. This provides a ready means of keeping the cylinders drained while the locomotive is standing. The cylinder cocks will also open in case the pressure in the cylinders exceeds the boiler pressure due to water being tapped in the cylinders.

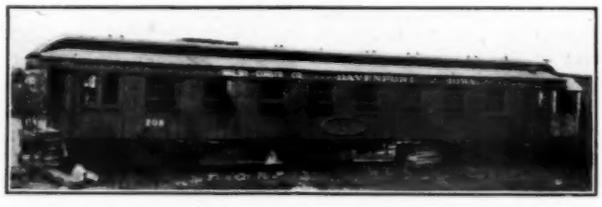
The Tender

The tender has a one-piece frame of cast steel and is carried on two four-wheel trucks having cast steel side frames. The fuel and water capacities are respectively 35,000 lb. and 11,000 gal. and an air operated water scoop is applied.

TABLE OF DIMENSIONS, WEIGHTS AND PROPORTIONS FOR THE PENNSYLVANIA CLASS M1 LOCOMOTIVES

Railroad	Pennsylvania
Builders	Baldwin 175
	Lima 25
Type of locomotive	4-8-2
Service	Heavy passenger and fast freight
Cylinders, diameter and stroke	27 in. by 30 in.
Valve gear, type	Walschaert
Valves, piston type, size	12 in.
Maximum travel	7 in.
Outside lap	1 7/16 in.
Exhaust clearance	7/16 in.
Lead in full gear	9/32 in.
Weights in working order:	
On drivers	266,500 lb.
On front truck	59,300 lb.
On trailing truck	56,600 lb.
Total engine	382,400 lb.
Total tender	217,900 lb.
Total engine and tender	600,300 lb.
Wheel bases:	
Driving	18 ft. 10 in.
Rigid	18 ft. 10 in.
Total engine	41 ft. ½ in.
Total engine and tender	79 ft. 3⅝ in.
Wheels, diameter outside tires:	
Driving	72 in.
Front truck	33 in.
Trailing truck	50 in.
Journals, diameter and length:	
Main	12 in. by 16 in.
Others	11 in. by 16 in.
Front truck	6½ in. by 12 in.
Trailing truck	6½ in by 12 in.
Boiler:	
Type	Belpaire
Steam pressure	250 lb.
Fuel	Bituminous
Diameter, minimum inside	82¼ in.
Combustion chamber, length	98 in.
Tubes, number and diameter	120—2¼ in.
Flues, number and diameter	170—3½ in.
Length over tube sheets	19 ft. 1 in.
Grate area	69.9 sq. ft.
Heating surfaces:	
Firebox and comb. chamber	370 sq. ft.
Arch tubes	29 sq. ft.
Tubes and flues	4,303 sq. ft.
Total evaporative	4,702 sq. ft.
Superheating	1,630 sq. ft.
Comb. evap. and superheating	6,332 sq. ft.
Tender:	
Water capacity	11,000 gal.
Fuel capacity	35,000 lb.
Wheels, diameter	36 in.
Journals, diameter and length	6½ in. by 12 in.
General data, estimated:	
Rated tractive force	64,550 lb.
Cylinder horsepower (Cole)	3,280
Weight proportions:	
Weight on drivers ÷ total weight engine, per cent	69.7
Weight on drivers ÷ tractive force	4.13
Total weight engine ÷ cylinder hp	116.7
Total weight engine ÷ total heating surface	60.5
Boiler proportions:	
Comb. heat. surface ÷ cylinder hp	1.93
Tractive force ÷ comb. heat. surface	10.25
Tractive force × diam. drivers ÷ comb. heat. surface	735
Cylinder hp. ÷ grate area	46.9
Firebox heating surface, per cent of evap. heat. surface	8.14
Comb. heat. surface ÷ grate area	90.6

THE AMERICAN RAILWAY ENGINEERING ASSOCIATION has selected the New Palmer House, Chicago, as headquarters for its next annual convention, to be held on March 8, 9 and 10, 1927.



Old Wagner Palace Car at Least 40 Years Old

The Walsh Construction Company Bought It from the Hagenbeck Wallace Circus. Photo taken at Bogota, N. J., on the West Shore.

R. B. A. Meeting and Dinner

Supply leaders hold forum on the railway supply industry and future railway progress

THE Railway Business Association held its annual meeting and dinner at the Hotel Commodore, New York, on November 18.

The attendance at the dinner totaled approximately 1,500 including leading representatives of the railroad and railway supply fields. Alba B. Johnson, president of the Association, presided, and the diners were addressed by Whitefoord R. Cole, president of the Louisville & Nashville, and by Simeon D. Fess, United States senator from Ohio.

The business meeting held in the morning of the same day included a forum on the Railway Supply Industry and Future Railway Progress. At this meeting there was read a paper on this subject prepared by Roy V. Wright, managing editor of the *Railway Age,* and read in his absence by C. B. Peck, mechanical department editor. There was also read a conference report from the association's general executive committee entitled "Problems of the Railway Supply Industry," and the subject was further discussed in papers by A. C. Moore, vice-president of the Chicago Railway Equipment Company, who spoke on the "Railway Attitude Toward Progress and Quality," by A. H. Mulliken, president of the Pettibone-Mulliken Company, who spoke on the "Policy of Railways Towards Prices," by Samuel O. Dunn, editor of the *Railway Age,* and by other leaders of the industry.

An abstract of Mr. Wright's paper follows:

Future of the Railway Supply Business

By Roy V. Wright
Managing Editor, *Railway Age*

For several years—since and including 1920—the Class I roads have expended in excess of a billion dollars a year, chargeable to the operating account, for materials and supplies, exclusive of fuel for locomotives. The average capital expenditure for additions and betterments for the Class I roads (including labor and materials) for the past three years—1923, '24 and '25—was about $896,000,000.

The materials and equipment used by railways are roughly divisible into two classes. First, ordinary or standard supplies for all departments which are so generally used by other industries and commercial concerns. Secondly, those exclusively made for and used by railroads.

To a great degree the first item can be dismissed from consideration at this time, since with the intelligent application of the mass production idea by the manufacturers of these materials, and with proper distribution, there is very little likelihood of the railroads finding it possible to justify manufacturing such general supplies in their own shops. This is all the more true because of the spirited competition in most of these materials and articles.

There are, broadly speaking, three ways, in one or all of which a railway may acquire supplies and equipment suitable to its requirements. First, by buying all the materials and equipment used by it from outside manufacturers. Second, by reclaiming and rebuilding used devices and equipment in its shops. Third, by manufacturing new devices and equipment in its shops. A subject which has been much discussed recently has been that of the extent to which railways should engage in reclamation and rebuilding work and also in the manufacturing of new devices and equipment.

The limitations of the railroads in attempting to perfect and manufacture special railroad devices can possibly best be illustrated by reviewing the development and application of a typical special device of this sort.—the locomotive superheater. For a great many years railroad officers were intrigued with the possibilities of a superheater on the locomotive. It gave great promise from the theoretical standpoint. The difficulty was to design and apply a practical device which would take advantage of the theoretical considerations. A number of mechanical department officers attempted to solve the problem and many experimental devices were tried out.

Eventually a company was formed with the expectation of finding some way of combining the best points of the several devices and perfecting a successful design.

When the company had perfected a marketable device, however, the task was only fairly well begun. It took years of the hardest kind of effort to get the railways generally to adopt the device. The long, painstaking and expensive promotion campaign included advertising, getting the facts before railroad clubs and other railroad and technical organizations, an intensive campaign of personal solicitation, and the organization of a corps of service engineers to educate the railroads in the proper use of the device as well as to follow up its working, and perfect the design as difficulties occurred under the great variety of conditions which it encountered.

If it had not been for a highly specialized organization, properly balanced as to promotion, sales and production ability and engineering talent, how extensively would the superheater be used in this country today and to what extent would the operating efficiency of the carriers suffer by having in its place a variety of less fully developed devices?

In general, the same thing may be said of a great variety of special devices and facilities used in the maintenance of equipment and maintenance of way, as well as in the operating, engineering, signal, telegraph, electrical, accounting and other departments, such as rail anchors, ballast cars, power tie tampers, ballast cleaners, locomotive cranes, ditchers, section motor cars, autogenous welding, water treatment, signaling apparatus, automatic train control, telegraph and telephone apparatus, M. C. B. billing machines, etc. Without the services of the highly specialized technical, industrial and commercial talent of the organizations now selling these things to the railroads, many of them would never have been developed, others would remain crude and inefficient and

the cost of many would practically prohibit or drastically limit their use.

The highly specialized development and manufacture of these devices has made them available to the railroads at a comparatively low cost, since the expense of development has been spread over the entire railroad field. Another beneficial result of this procedure has been the standardization of these details and devices over the railroads in general. This in itself is an important consideration, when it comes to the cost of production and distribution.

There is another factor which it is difficult to weigh, but which cannot be dismissed carelessly. The inventor of a railroad device, spurred on by the hope of its adoption and the financial returns which will follow, throws himself heart and soul into the working out and promotion of his particular device. To what extent this same urge will be present, if the manufacture and use of the device were to be restricted to the individual railroads, is a grave question.

Industry's Contribution to Progress

The railway supply manufacturer has, indeed, made a remarkable contribution in helping to bring about the present high state of efficiency of the transportation machine. And yet we know that on the drawing boards, or being tried out in an experimental way, are improvements which promise to revolutionize railroad equipment and operation in the next quarter of a century.

Just a word as to materials. Here the railroads must fall back almost entirely upon the supply interests. The developing of better and better materials in American industry in the past quarter of a century and their adaptation to our practical benefit, reads almost like a romance. Every department of the railroad has felt its influence in the form of more satisfactory and more durable devices and equipment. In some cases designs have been radically changed for the better, and the life of a piece of equipment or apparatus has been greatly extended with reduced maintenance and repair costs. Here the manufacturer still has almost unlimited possibilities.

Utilizing Reclaimed Material

There has been considerable criticism of some railroads because of the extent to which they have gone in working over and manufacturing reclaimed material. This tendency was greatly extended during the World War because of the shortage of materials and the difficulty in securing supplies of all kinds. It is true that many roads had engaged in the manufacture of reclaimed material to a limited extent for a number of years preceding the war, but the World War conditions gave the movement a great impetus.

Railroad officers have found that it is necessary to gage this work on the basis of changing conditions and that the only safe way of keeping it on a sound business basis is periodically to check the cost of the items manufactured in this way with the cost of buying them in the open market. Greater and greater care is being taken in the accounting to include all the factors involved; there is undoubtedly, however, much progress still to be made in this respect in order to make fair and accurate comparisons with the costs of purchasing from the outside. One occasionally has to smile at the naive and simple methods which are used in making such comparisons. It is interesting to note that some railroads, after a reasonably accurate determination of the proper amount of overhead, have found it to their interest to discontinue manufacturing some items. It is recognized that comparable data as to the costs of reclamation, even as between the different railroads, are not now available because of the lack of a standard basis of accounting.

What are the elements of cost entering into any manufactured article? Roughly, they may be divided into two groups: First, the direct costs of labor and material. Second, the overhead, surcharge or burden, as it is variously called. An elaborate treatise would be required to outline completely the extent and importance of this element. Among some of the more important items it includes interest, repairs and depreciation on buildings and machinery; interest on land; insurance; taxes; superintendence and office; accounting; drawing room; spoiled work; laborers and watchmen; supplies and small tools; power, light, heat and water, etc.

Overhead

Too frequently little attention is paid to this overhead item, because it is asserted that the reclamation work is incidental and a by-product of the existing organization and building capacity. This, however, is a dangerous assumption. If a little manufacturing is good, the average officer probably will ask himself, why not more? This soon leads to a condition where it becomes necessary to purchase new facilities or to provide building space, otherwise unnecessary, or to occupy space which is badly needed for the direct operation of repairing equipment, and ultimately some additional plant or organization overhead is likely to be incurred. Then the costs with which the railroad companies compare the market prices of similar material become false and the railroad is the loser.

Perhaps one of the reasons why so little attention is paid to these overhead items is that the system of accounting prescribed for the railways places great difficulty in the way of setting up accurate costs for these incidental activities. However effective this system may be in relation to the primary business of transportation, it is badly in need of some supplementary classification. Before clear thinking and correct business policies can be fully developed with respect to these secondary, competitive operations, some method must be developed for bringing together from widely scattered maintenance and property accounts the items necessary for cost finding.

The manufacturer is in an excellent position to produce and distribute at the lowest possible unit costs by the proper application of highly specialized and mass production methods. The railroad must make every reasonable effort to conserve material and reduce its costs; this should include, among other things, the provision of scientific methods of determining its manufacturing costs to permit intelligent comparison with the prices of the outside manufacturers. It is doubtful if this is now being done in very many instances.

Rebuilding Equipment

When we come to a consideration of rebuilding equipment, we enter a most difficult field. For many years some railroads have deemed it advisable to contract out a certain part of the rebuilding of freight cars. Many railroads, under post-war conditions, found it necessary to contract out the repairing of a considerable percentage of their bad-order locomotives and cars.

Unfortunately, for reasons which time will not permit discussing here, a controversy ensued and the Interstate Commerce Commission, based upon the experiences of that period, has been interpreted to have assumed an attitude of deprecating contract rebuilding. May I direct your attention to the fact, however, that conditions were at that time abnormal and are not at all comparable with those now existing. What might it not have cost this country had not these repairs been facilitated by

contracting out? Why should the railroad managers' hands be tied today, because of emergency measures which may have been taken during the period of disorganization and abnormal conditions which existed in 1920?

That a wonderful advance all along the line has been made since that time, and that the railroads have had a large share in it is indicated by the following quotation from the annual report of Secretary Hoover of the Department of Commerce:

"The railways, during the past five years, not only have built up adequate service and given a complete correction to these ills, but they have, by great ability of their managers, greatly reduced transportation costs and thus made rate reductions possible which would not have been otherwise the case."

What the contract rebuilders need is a "hands off" policy on the part of the commission and the privilege of being allowed to demonstrate their ability to serve the railroads beter than the latter can serve themselves. They seem confident that they can make a good showing if the comparisons are made on a comprehensive and accurate basis. That they will have to put forth "their best foot" is indicated by the improved morale and better organization of the railroad equipment maintenance forces during recent years.

Cost Standards

Here, as in the case of manufacturing reclaimed material, steps should be taken to establish standards for comparison of costs and quality of workmanship as between the railroads and the contract rebuilders.

In 1923, immediately following the great shop employees' strike, the purchases of locomotives and freight cars made by the railways were very large. The capital expenditures made for equipment exceeded those made for improvement of permanent structures, and operating expenditures for maintenance of equipment were relatively much larger than those for maintenance of way.

During the last two or three years there has been a reversal of these conditions. Capital expenditures for the improvement and enlarging of tracks and permanent structures have exceeded those for equipment, and expenditures for maintenance of way have been relatively much larger as compared with those for maintenance of equipment than previously. It seems a significant fact that while a good deal has been heard about curtailment of railway purchases, the charges made to operating expenses for "Materials, Supplies and Miscellaneous" in 1925 were greater than in any previous year except 1920, when prices were much higher, and 1923, when expenditures for maintenance of equipment were very large. It would seem that if we take into consideration the changes that have occurred in prices the amount of materials and supplies bought in 1925 were larger than in any previous year since the war. Capital and maintenance expenditures on tracks and permanent structures have increased, while expenditures for equipment have declined since 1923.

Building New Equipment

Comparatively few roads make any effort to build new locomotives or cars in their own shops, except as a stabilizer for the repair shop forces. The extent to which this procedure is justified, except possibly for stabilization purposes, is open to serious question. A locomotive or car building plant is specially designed for the utilization of intensive production methods.

It must also be recalled that the manufacturers of equipment have made a most substantial contribution in the way of improved designs. Few railroads today are equipped with the necessary engineering forces for the proper design of equipment. The manufacturers have gone to great lengths to secure the best engineering talent and to keep well in advance of current practice in attempting to meet new conditions and tendencies and to improve their product in every way. The railroad engineering departments, considering the amount of equipment that most roads need, can hardly afford to maintain highly specialized forces for the designing of new equipment; moreover, the engineering staff is constantly confronted and harassed with a great number and variety of problems relating to operation and maintenance.

It is questionable as to whether a railroad can afford to build its own equipment, except under the most unusual conditions; nor does it appear that tendencies toward consolidation will affect this situation, for even the very largest systems at present continue, in a large degree, to recognize their dependence upon the equipment builders.

Freight cars are rapidly being standardized by the American Railway Association. These standards are going much further into details than has ever been done before and leave little of the car structure open, except for the application of specialties. Alternative standards have even been adopted for the trucks as a whole. How long are these standards to last? Are we to assume that a state of perfection has been reached which will require no further consideration to be given to general improvements in freight car design or construction? Considering the fact that railroad traffic development seems still to be in a state of flux with a constant tendency for new requirements to appear, it seems inconceivable that these two questions can be answered in the affirmative. With the railroads quite generally committed to these standard designs, however, is this whole situation, then, not a challenge to the car builders to see that no opportunity is overlooked for improvements in these standard designs as conditions make improvements desirable? The builders who can take a progressive attitude in this matter, particularly in matters affecting the cost of construction or the ultimate life of the equipment, will undoubtedly be rewarded for their efforts, because the railroads, although not likely to take the initiative in developing changes in these standards, will undoubtedly be ready to profit by any economically sound changes or improvements made available for them.

Equipment Market

Car and locomotive builders have been greatly concerned during the past few years because of the lack of orders. Contrary to all expectations and predictions, extensive orders for new equipment have failed to materialize. This is because of economic pressure and the greater utilization of existing equipment.

The railroads have handled a record-breaking traffic this summer and fall with what would have appeared a few years ago to be entirely inadequate equipment, and yet there has been no congestion and the manufacturers and merchants continue to feel perfectly safe in carrying a minimum amount of material in stock because they feel assured of quick and sure transportation service.

When Will Orders Come?

When will the equipment builders be rewarded with orders? This country continues to grow and the average standard of living is steadily rising. Certain types of competition are tending and probably will tend further to stimulate the growth of the country. While, therefore, the railroads may not carry as large a proportion of the entire traffic as formerly, the result as a whole will be so

to increase the total amount of transportation required, that they will be assured of a steady growing business.

In this connection there is a point of importance that should not be overlooked. While the freight business of the railways has been growing and is now larger than ever before, it has not grown as fast since the war, measured by tons carried one mile, as it commonly did before. Undoubtedly, a reason of some importance for this is that, as is well known, there has been within recent years a very large reduction in commercial inventories of all kinds. This is a healthy process which the improvement in transportation service has made possible. Plainly however, the reduction of inventories has, while it has been going on, made the increase of freight business less than it otherwise would have been. There is, of course, a limit below which inventories cannot be reduced, and when this limit has been reached the volume of freight business will not be further affected by reductions of inventories. On the other hand, the national movement in the interest of material conservation, and the startling improvement in fuel economy have necessarily had some considerable influence in slowing up the rate of freight traffic increase.

There still remain possibilities of greater equipment utilization. The later designs of locomotive, however, are showing such remarkable results in the low cost of operation that the time is not far distant when a railroad cannot justify itself in continuing to maintain the older equipment, in some classes of service at least. *It would seem that the slack has been largely taken up.* Another interesting point of view is a recent article in the *Railway Age* by Major Edwin C. Kelton, Corps of Engineers, U. S. A., in which he advocates a greater reserve of railroad equipment and facilities in the interest of national defense. Under former conditions the railroads were operated so much less efficiently that there was in effect a reserve which could be drawn upon in emergencies.

This Major Kelton says, is not now true and we must be governed accordingly.

The question is, whether we have a sufficient reserve to protect us with the steadily growing demands for greater and better service. If we fail in this respect, how will the public, which has become acustomed to quick and good service, react, and what will be the effect on business and prosperity in general? Considering the responsibilities with which they are charged the carriers cannot afford to take too great a chance. They must have a sufficient reserve of equipment to protect the public under conditions of maximum business.

In Conclusion

The interests of the railways and the railway supply industry are so intimately interwoven that it is impossible to separate them. The railroads are interested in furnishing that standard of transportation which will best meet the public requirements. They are specialists on transportation and that in itself is no mean task.

The railway supply manufacturers, specializing upon the development, production and sale of equipment and supplies—and enjoying plenty of competition—have made a truly remarkable contribution to the railroads and the public served by them. The supply manufacturer must keep in intimate contact with the railway operating problems and practices. He frequently goes to the railroads for men for important places in his organization. He relieves the railroad organizations of production details which they are not suited to handle because of the necessity of concentrating their efforts in other directions. It is difficult to see how they can get along without each other—they are like the Siamese twins, inseparable.

In the public interest the practical ideals of the railroads must be to get the greatest value for the money they spend for the things they buy—values measured in decreased maintenance and operating costs, in increased capacity, in increased utilization and in increased durability. While the interests of the railways and the railway supply industry, with respect to these ideals, are so intimately interwoven that it is impossible to separate them, we can not close our eyes to the fact that situations arise in which fragments of these interests, during temporary periods at least, fail to point in exactly parallel directions. The solution of the problems thus created for some units of the supply industry may at times tax the wisdom and foresight of the highest type of executive and managerial ability. Only that solution can endure which is based on a clear understanding that in such situations the public interest is paramount.

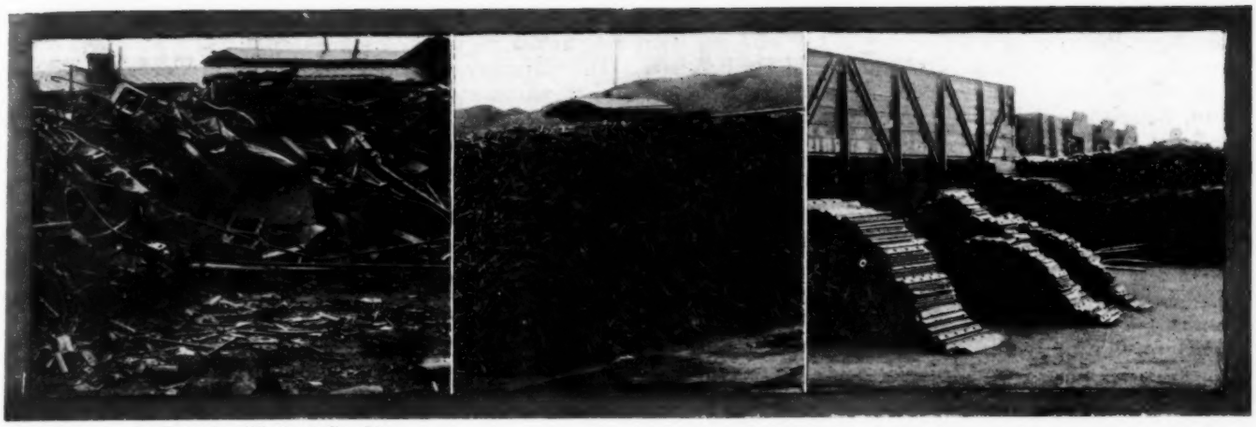
The manufacturers are continually striving to improve their products—make them more effective and durable so that the railways in their own interests will be forced to buy them. The railways are fully protected in this respect by the competition in the supply field. It is impossible to see far into the future. We do know, however, that this country must have cheap transportation and plenty of it. Public welfare demands that coordination of the various types of transportation which will best meet its needs—economic forces will decide the extent to which the different elements will be used. At present, however, there is no indication that the railroads, if they continue to improve as they have in the past, will not have to continue to carry the brunt of the burden.

Resolutions

Resolutions were adopted urging that transportation rate levels should have in view the strengthening of the market for railway stock; opposing regional appointment of Interstate Commerce Commissioners; opposing legislative rate making, including the Pullman surcharge repeal bills; favoring retention by the Commission of its discretion to grant relief from the long and short haul section; favoring exclusion of coercive features from any legislation in furtherance of railway unifications; congratulating the automobile industry and the railway executives on the spirit of co-operation in which they are approaching the problem of governmental regulation of motor vehicles; emphasizing the inequity in the relation between the normal income tax rate affecting individuals and partnerships at 5 per cent and corporations at 13½ per cent and declaring that the government should be just before it is generous, granting permanent or temporary relief to stockholders and consumers through reduction in the corporate tax rate; expressing good will toward the Chamber of Commerce of the United States.

Election of Officers

Four new vice-presidents were elected: W. L. Conwell, New York; George A. Martin, Cleveland; M. G. Truman, Chicago; Harry Scullin, St. Louis. Officers re-elected were three vice-presidents: Samuel B. Hastings, Chicago; B. L. Winchell, New York, and Herbert I. Lord, Detroit; president, Alba B. Johnson, Philadelphia, and treasurer, P. Harvey Middleton, Philadelphia. Appointment of executive members to fill vacancies caused by expiration of terms and otherwise will be announced later. The secretary, Frank W. Noxon, holds office during the pleasure of the general executive committee.



Some Steps in the Salvaging Work at Corwith

Reclamation on the Santa Fe

*Plant at Corwith near Chicago developed from nothing— 9000 tons of material salvaged last year**

By Robert K. Graham
General Superintendent, Corwith Reclamation Plant, Chicago

WHAT is reclamation? There is a difference of opinion on the word. On the A. T. & S. F., it is applied to restore to use any article or material that has found its way to the scrap heap, having been previously condemned and scrapped by the department formerly using it, and considered valueless except for what it will bring in the scrap market.

The reclamation of condemned material was an unrecognized source of profit on practically every railroad in the country until within the last 15 years. It was much easier to cast aside and discard a worn, broken tool or dismantled material, and apply to the storekeeper for new, than to attempt to repair it or find other use for it.

Santa Fe the Pioneer in Reclamation

The Santa Fe was the first railroad to inaugurate regular railroad reclamation work. Several years ago it started a yard at Corwith, Chicago, for the recovery and sorting of all scrapped material. It was remote from either the yards or shops. It was then known as the Santa Fe Corwith Scrap Yard, but has since been termed the Corwith Reclamation Plant.

In the ordinary course of sorting into merchantable classifications, the scrap that came to the scrap yards, it was discovered that a considerable portion of the scrap was fit for further use, some of it without any shop or repair work whatever. All this was put back into service as new material. This was clearly reclamation work.

It was also found that a great deal of the condemned material could be made as serviceable as new, with very little repair, or with small expense for shop work, be made over for other uses.

Aside from the salvaging of material from the scrap heap, efforts were also made to decrease the volume of scrapped material. All operating, maintenance or mechanical employees were instructed to continue in use any material as long as it would be safe. A marked decrease in the volume of condemned material was early noted.

The Santa Fe reclaims track jacks, switch stands, tamping picks, angle cocks, switch chains, nuts, bolts, spikes, track shovels, etc.

In 1909, the Corwith plant consisted only of one 10 ft. by 12 ft. hand car shanty, used for an office, and one box car body, used as a blacksmith shop, containing one blacksmith forge. The force consisted of one blacksmith and one helper. These two men sharpened 10 to 12 picks per day. In 1925, the shops and storehouses covered three docks and an additional floor space of 10 acres, housing about $300,000 worth of machinery.

Corwith Saves $245,000 in 1925

During 1923, there were reclaimed from scrap, 8,686 tons of material that went through the shops while 914 tons needing no repairs were shipped back on the line on requisition. The net saving from brake beams was, $9,496; coil springs, $5,436; truck jacks, $5,911; switch stands, $7,806; tamping picks, $4,283; switch chains, $3,372; angle cocks, $6,264; and from C-6 feed valves, $1,170. These are only a few of the items. The saving in the blacksmith shop work alone was $73,246, and including all departments, the net saving was $245,733. The net saving from material sorted from scrap which did not need repairs and was shipped back on the road on requisition was $76,805.

From June, 1924, until June, 1925, about three million tie plates were repunched and shipped on requisitions at a cost of about one cent each. These answered the same purpose as new plates costing about 19 cents each, making a saving of $191,284. If these had been sold as scrap at the best market price, the company would have received $8,000, making a net saving of $183,284.

Two rolling mills are operated at Corwith, one 22-in.

* From a paper read before the Western Society of Engineers, Chicago.

three-stand bar mill and a Belgian 12-in. roughing and 9-in. finishing mill. During 1925, working 175 days, the mills turned out 11,277,800 lb. of finished iron in all sizes from ¼-in. to 2-in. rounds and ½-in. by ⅓-in. flats up to 1-in. by 10-in. flats. This iron was produced on the Amalgamated Association's scale at a cost of $233,825, making a saving of $36,561 for the year.

Savings Not Fictitious

As a by-product of the railroad business, the reclamation and salvage deserves more than mere consideration. These results are not shown by any fiction in accounting. Accurate records are kept. When an order is received for any quantity, large or small, it is given a shop order number, in its progress through the shop it is charged with the scrap value at selling price, the labor cost, new material, if any is used, its proportion of overhead expense, including supervision, shop expense, material and labor. As nearly as possible actual profits are obtained.

The success of the Santa Fe reclamation work has been studied by other railroads, which have since established similar plants of their own. The main credit for this work belongs to the purchasing department. All the output is directed through requisitions from the stores department.

It has been said that reclamation is not a one-man job. In the sense that co-operation is needed in this line of work as well as in any other, that is true. It is my experience and observation, however, that a single head in immediate charge of the salvaging of material, with constructive responsibility, will bring larger and more profitable returns than when the responsibility is divided among several heads, departments, committees, or shops.

The subject of reclamation is a broad one. Our experience shows every day where extensions of savings and salvage or reclamation can be made. Salvage and reclamation should be extended. Developing intelligently managed systems of salvage will make reclamation by the railroads compare favorably with earnings of other industries.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended November 6 began to show the effects of the usual seasonal decline, which came a little later than usual this year, as well as the effects of election day. The total was 1,137,210 cars, an increase of 74,564 cars as compared with the corresponding week of last year and of 141,931 cars as compared with 1924. This was the 24th week of the year to show a loading in excess of a million cars and brought the total for 45 weeks up to 46,395,123 cars, an increase of 1,902,374 cars as compared with the corresponding period of last year and of 4,242,470 cars as compared with 1924. The Car Service Division now estimates the total loading for 52 weeks of this year at 52,700,939 cars, an increase of 1,532,979 cars or 3 per cent over the total for 1925.

Increases as compared with both 1925 and 1924 were reported from all districts, and all commodity classifications showed increases as compared with 1925 except livestock and coke, while all showed increases as compared with 1924 except grain and grain products and coke. Coal loading for the week amounted to 227,574 cars, an increase of 38,209 cars as compared with the corresponding week of last year but somewhat less than the loading for the preceding week. Miscellaneous loading amounted to 419,057 cars, an increase of 21,342 cars. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

REVENUE FREIGHT LOADED, WEEK ENDED SATURDAY, NOVEMBER 6, 1926

Districts	1926	1925	1924
Eastern	258,753	239,541	231,549
Allegheny	228,786	207,544	195,573
Pocahontas	60,800	57,660	45,713
Southern	164,548	152,850	150,791
Northwestern	162,216	156,520	134,068
Central Western	172,728	167,830	160,787
Southwestern	89,379	80,701	76,798
Total Western Districts	424,323	405,051	371,653
Total all roads	1,137,210	1,062,646	995,279
Commodities			
Grain and grain products	50,003	46,363	54,765
Live stock	37,068	38,104	37,050
Coal	227,574	189,365	172,764
Coke	13,016	16,020	9,592
Forest products	69,469	64,984	67,403
Ore	48,271	42,312	23,936
Mdse. L. C. L.	272,752	267,783	252,759
Miscellaneous	419,057	397,715	377,010
November 6	1,137,210	1,062,646	995,279
October 30	1,216,432	1,091,154	1,073,374
October 23	1,209,043	1,120,677	1,113,053
October 16	1,210,163	1,106,009	1,102,300
October 9	1,184,862	1,106,036	1,088,956
Cumulative total, 44 weeks	46,395,123	44,492,749	42,152,653

The freight car surplus for the week ended October 31 averaged 81,011 cars, an increase of 1,995 cars as compared with the preceding week. This included 12,106 coal cars, 45,148 box cars and 3,749 refrigerator cars. There were also shortages amounting to 1,945 cars, of which 1,360 were coal cars.

The Canadian roads for the same period had a surplus of 4,100 cars, including 3,200 box cars.

Car Loading in Canada

For the fourth consecutive week Canadian car-loadings have been heavier than in any week in previous years. Total loadings for the week ended November 6 were 83,812 cars, which was 269 cars less than the previous week, but an increase of 6,482 cars over the corresponding week of 1925.

The increase over last year was accountable chiefly by large gains in the western division. Coal and general merchandise showed large advances.

	Total for Canada			Cumulative Totals to Date	
	Nov. 6	Oct. 30	Nov. 7		
Commodities	1926	1926	1925	1926	1925
Grain and Grain Products	23,990	22,090	20,752	392,785	367,582
Live Stock	3,280	3,499	3,274	96,927	106,124
Coal	9,163	9,029	7,600	263,016	181,635
Coke	501	493	400	16,371	12,799
Lumber	3,595	3,923	3,481	161,082	158,257
Pulpwood	1,181	1,587	1,327	115,661	110,986
Pulp and Paper	2,318	2,275	2,192	104,772	89,977
Other Forest Products	3,125	3,215	2,934	136,492	124,239
Ore	2,236	2,367	1,823	77,980	62,771
Merchandise, l. c. l.	18,173	17,854	16,899	724,437	676,625
Miscellaneous	16,250	17,749	16,648	636,199	573,009
Total cars loaded	83,812	84,081	77,330	2,725,722	2,464,004
Total cars received from connections	37,861	40,626	34,926	1,645,152	1,466,608

AT NORFOLK, VA., on November 13, Major Mario de' Bernardi of Italy, flying in a race over a triangular course of 350 kilometers, traversed a distance of 217,483 miles at a speed of 246½ miles an hour, establishing a new world's record. Major de' Bernardi made the course in 52 minutes, 56.22 seconds; and the next contestant, Lieutenant C. F. Schilt of the U. S. Marine Corps, made it in 56 minutes, 23.96 seconds.

Public Utility Commissioners Meet at Asheville

Overcrowded program prevents several excellent railroad reports from receiving adequate consideration

A SOMEWHAT overcrowded program combined with which there was possibly too much time given in the sessions to less essential details prevented the 38th annual meeting of the National Association of Railroad and Public Utilities Commissioners, held at Asheville, N. C., November 9 to 12, from achieving first rank as an entirely successful convention. In spite of the skill of an able presiding officer, several of the sessions were as monotonous as are many of the hearings over which public utility commissioners are called upon to preside in the course of their duties. Fortunately, these were compensated for by several sessions of which the opposite was true, particularly the session at which motor vehicle regulation was considered and these sessions at which members of the Interstate Commerce Commission spoke or those in which there were addresses by representatives of various public utility interests. The overburdened program was especially detrimental to the railroad features of the convention. Time was lacking for the reading of one important report of great interest to the railroads; another paper on a railroad subject scheduled was not read because the author was not present, and in the case of two or three other committee reports on railroad subjects presented at the last session, no time was left for discussion of the important matters covered.

About a hundred members of the federal and state commissions attended, including Chairman Joseph B. Eastman and J. J. Esch of the Interstate Commerce Commission, both of whom read papers. Ernest I. Lewis, also of the federal commission, was chairman of the committee on public relations which prepared an interesting report on education in matters of public utility regulation. A round table discussion had been planned for this subject but in the absence of Commissioner Lewis the projected round table was not held and the report was accepted without being read. A paper scheduled on the program to be read by H. E. McKeown, chairman of the Board of Railway Commissioners for Canada, entitled "Regulation in Canada," also was omitted because of the author's absence.

Interstate Motor Vehicle Regulation

The feature of the program was the discussion of motor vehicle regulation. The session devoted to this subject was presided over by Clyde H. Jones of Indiana, chairman of the Committee on Motor Vehicle Legislation. Besides the committee reports a paper was read by C. C. McChord, former Interstate Commerce Commissioner, now counsel of the National Automobile Chamber of Commerce, entitled "Interstate Regulation of Motor Vehicles." There was more discussion brought out at this session than at any other. The question was as to what policy the association should follow as to interstate bus and truck regulation. The organization has already assisted in the formulation of a bill, S.-1734, which was introduced in the Senate by the late Senator Cummins. The Minnesota commissioners opposed this bill, pointing out interstate regulation of motor vehicles was an invasion of state's rights. The commissioners, the Minnesota representatives said, had continually put themselves on record as opposing further invasion of state's rights while with this bill they were asking Congress to take an important step in taking away the rights of the states. Other commissioners explained that there was an urgent necessity for federal action because the Supreme Court had held that the states could not regulate interstate motor traffic and various instances were given of what was termed the unfair competition between unregulated interstate motor vehicles with regulated intrastate operations. Another question that brought out considerable argument was as to whether the association should favor interstate regulation of motor trucks as well as buses. It was contended by some that the principles were the same. Others pointed out that good reasons had been offered why interstate motor truck traffic should not be subjected to federal regulation at this time and it was submitted that if the attempt were made to push legislation covering both freight and passenger services at this time, opposition to the truck regulation would be sufficient to defeat attempts to regulate either.

The final decision on these points was to continue the committees or, in other words, to sanction the work already done with reference to the furthering of legislation which legislation deals with motor bus transportation only.

The committee on statistics and accounts of public utility companies, Walter J. Fitzpatrick, chief accountant of the Public Service Commission of New York, chairman, presented as a part of its report two classifications of accounts, one for bus operating companies having operating revenues exceeding $100,000 annually and one less detailed for companies having smaller revenues. These classifications have already been accepted by the American Electric Railway Association and are proposed for adoption by the various state regulatory bodies with such changes as are necessary to conform to differing legal and other requirements of the several states.

A further report of the activity of the meeting in the matter of the regulation of motor transportation will appear in the Motor Transport Section of the *Railway Age*.

Several Railroad Reports Slighted

The reports on railroads to which the association did not have time to give what the commissioners believed to be entirely adequate attention included the report of the Committee on Valuation, Dwight N. Lewis of the Iowa Board of Railroad Commissioners, chairman; the report of the Committee on Grade Crossings and Trespassing on Railroads, F. T. Singleton of the Indiana Public Service Commission, chairman, and the report of the Committee on Statistics and Accounts, R. Hudson Burr of the Florida Railroad Commission, chairman. The reports were presented, however, and will be found in abstract below. The Committee on Car Service and Demurrage, O. P. B. Jacobson of the Minnesota Rail-

road and Warehouse Commission, chairman, presented a brief report to the effect that the subject was a dead issue due to the activity of the Car Service Division, A. R. A., and he suggested that his committee be eliminated. Similarly Clarence E. Gilmore of the Texas Railroad Commission in presenting the report of his committee on Capitalization and Intercorporate Relationships, said that the committee had found nothing to suggest the necessity or desirability of a report.

The convention was addressed by several representatives of the utilities. Included was R. H. Aishton, president of the American Railway Association; M. H. Aylesworth, president of the National Broadcasting Company and a former member of the Colorado commission; Alexander Forward, secretary-manager of the American Gas Association and a former member of the Virginia commission; Carl D. Jackson of the American Bar Association, a former member of the Wisconsin commission; John H. Small, chairman of the Rivers and Harbors Congress; E. W. Bemis of Chicago, and, as already mentioned, C. C. McChord of the National Automobile Chamber of Commerce.

Aishton Addresses Commissioners

President R. H. Aishton of the American Railway Association talked on co-operation as it has worked out in the past year or two through the meeting together of the Interstate Commerce Commission, the state commissions and the railroads to solve such problems of transportation service as have been met in connection with the congestion in Florida last winter, and more recently in connection with the movement of California grapes, Maine potatoes, etc. His purpose in speaking, he said in his brief talk, was to make proper acknowledgment to the commissioners for the great co-operation they had given in such instances. He expressed the view that with the growth of railway traffic similar problems would continue to arise and he said the American Railway Association would make every effort to have the co-operation continue.

Last week's issue of the *Railway Age* contained the president's address by A. G. Patterson of the Alabama Public Service Commission and the paper by Chairman Eastman of the Interstate Commerce Commission.

Encroachment on State Rights

Commissioner Esch's paper was an extended review of the historical reasons for the so-called commerce clause of the United States Constitution, paragraph 3 of section 8 of Article I which gives Congress the power "To regulate commerce with foreign nations and among the several states and with the Indian tribes." He sketched the history of the legislation under the clause down to the Transportation Act and discussed also the degree with which Congress had legislated on many points hitherto held to be within the provinces of the states. The high point of his address was a paragraph reading:

"It is pertinent to inquire why Congress in mounting volume enacts such penal statutes making what was and still could be reached under state laws, federal offenses. Why this permitted encroachment upon the police powers of the states? Why this trend toward centralization in the federal government? Is it because of a growing inclination on the part of the states to shift the cost of punishing crime from the state to the federal treasury, the government aiding the states in the enforcement of their own laws? Is it because of a belief on the part of the people that the federal government through its long, strong arm can more effectually reach out to the uttermost parts of the country and bring offenders to justice?

Is it because people believe that a jury in a federal court would not be so influenced by local conditions as would be the case where the offender is tried by a jury of the vicinage? Whatever may be the reason, the situation demands calm reflection and a reassessment on the part of the states, if they would preserve self government of their duties and obligations under our dual system.

"That a note of warning against the unlawful expansion of the commerce clause has already been given is indicated by the Supreme Court of the United States in its recent decisions declaring two child labor acts unconstitutional."

Co-operation Between I. C. C. and State Commissions

The committee on co-operation between federal and state commissions, Paul A. Walker of the Oklahoma Corporation Commission, chairman, in an extended report reviewed the progress made in the co-operation between the Interstate Commerce Commission and the state regulatory bodies since the so-called co-operative agreement was made on May 3, 1922. It quoted from the I. C. C. annual report and from letters exchanged on the subject. The general tenor of the report was to the effect that very satisfactory progress had been made. In conclusion, it added, "Your committee deems it proper to remind every member of this association that co-operative conferences, letters and memorandums relating thereto, and proposed reports in co-operative cases must be handled by every individual participant in absolute good faith and confidence, free from all motives except that of achieving the best possible results in a common enterprise of public importance."

The chairman, in presenting his report, added that the degree of success obtained with co-operation will be a determining factor in future legislation. That agreement was had with the views of Chairman Eastman of the I.C.C. expressed in his address before the convention was indicated by the committee's request that it be allowed to incorporate in its own report those parts of Mr. Eastman's remarks dealing with co-operation.

Report of Committee on State and Federal Legislation

The committee on state and federal legislation, Charles Webster, of the Iowa Board of Railroad Commissioners, chairman, asked the association to reaffirm its previous position on federal legislation wherein it has asked Congress to change the law so as to restore some of the jurisdiction over rates of the state commissions taken from them by the Transportation Act. On this point it said:

"This committee in late years has made short reports. Its activities have been confined to federal legislation, and since the Transportation Act was enacted in 1920 the Congress has stood gazing at that production with mixed hope and fear. Hence there has not been much for the committee to report.

"In our last report we said: 'That the Transportation Act will some time be substantially amended we do not doubt. When that time will come we do not attempt to foretell.' That time has not yet come. We, however, entertain the same view which was expressed by the committee at that time, both as to the prob-

ability of ultimate legislation, and as to the form which that legislation should take as respects the rail carriers.

"Your committee leaves the matters of railroad consolidation and motor vehicle legislation to be dealt with by the special committees having those matters in charge. As to other legislation affecting rail carriers, it recommends reaffirmance of the heretofore expressed attitude of this association, and makes no other recommendations."

The report of the committee on express and other contract carriers by rail, Berkley D. Adams of the Virginia State Corporation Commission, chairman, included an interesting history of the express business in this country and a description of the uniform express contract.

Safety of Railroad Operation

The chairman of the committee on safety of railroad operation was F. W. Matson of the Minnesota Railroad and Warehouse Commission. The report gave a statistical review of the accident record of the past ten years but the more interesting part of the report was a description of the working of the Minnesota stop law and the efforts made by the state highway commission to eliminate highway grade crossings by re-routing trunk highways. The report also made suggestions relative to possible co-operation between the Interstate Commerce Commission and the state commissions in checking observance of the safety appliances and other laws. Those parts of the report dealing with these features are given below. A feature in connection with the discussion of this report—peculiar considering the strong assertions made at many times during the meeting in favor of states' rights—was a suggestion made that it might be worth while to appeal to Congress for federal aid for highway grade crossing elimination. Representative W. D. Upshaw of Georgia who was present said that he had prepared a bill with this in view that he proposed to offer at the next session of Congress.

From a study of the laws and rules of the Interstate Commerce Commission and of the various state Commissions, your Committee is led to believe that the great trouble with both the laws and the rules is the lack of the necessary help with which to properly police or enforce them. There are not sufficient inspectors to cover the ground thoroughly enough to prevent violations creeping in, and the railroad employees are not always prompt enough in reporting grab irons on cars, loose brake staffs not properly operating, and various other defects which may cause loss of life or serious injury.

In Wisconsin a system of co-operation has grown up between the state and interstate commission, and this co-operation has brought about a considerable improvement in conditions in that state. However, even greater force may be imparted to the various federal and state acts if the various inspectors of the states can be clothed with authority by the Interstate Commerce Commission to enforce the rules and rulings of that commission when violations thereof are found by the state inspectors. For the state inspectors to report violations to their own commissions, and then have them transmitted to the federal commission is a slow process, and your committee recommends that the committee on co-operation between the Interstate Commerce Commission and the state commissions work out some plan whereby the state inspectors are given authority by the federal commission to enforce its rules and regulations.

The Minnesota grade crossing law has now been in operation for about one year. This law authorizes the Railroad and Warehouse Commission to designate particularly dangerous crossings as "stop" crossings, and requires all drivers to come to a full stop at such crossings under penalty. The commission has exercised great care in the selection of the crossings to be so designated, and only about ten per cent of the crossings in the state are so marked. The enforcement of the law is in the hands of the local authorities, and results vary depending upon their activities. The placing of the signs and the publicity given them has accomplished great good, as the drivers who do not actually come to a dead stop, no doubt do look and proceed over the crossings more carefully. This is shown by the reduction in the number of accidents, although the number of cars in use has greatly increased.

The adoption by all states of a uniform law empowering the commissions to designate dangerous grade crossings at which drivers of automobiles and other vehicles must stop, as recommended by the National Conference on Street and Highway Safety, is highly desirable and should have the active support of this association.

In Minnesota the state highway commission, in connection with its road building program, is very active in the re-routing of the trunk highways in a manner so as to eliminate all grade crossings that it is possible to do away with. In such work they are meeting with much co-operation from the railroads, and where crossings are necessary the railroad and the commission are eliminating the grade crossing by the construction of overhead or underground crossings and sharing in the expense of such improvement. When the state highway commission took over the trunk highway system in Minnesota in November, 1920, there were approximately 932 grade crossings to be contended with in connection with the 7,000 mile trunk highway project. The highway department, by the end of the year 1926, expects to have eliminated 357 of this number. Of the 357 eliminated, 44 will have been by overhead structures, 80 by underpasses and 233 by relocation of the highways. Further crossings will be eliminated by one or the other of the above methods as the trunk highway projects are further extended. The policy of the state highway commission is one to be commended, and the good work has no doubt already saved the lives of many of our own citizens and citizens of other states.

Report of Committee on Public Ownership

The committee on public ownership and operation, George P. Pell, of the North Carolina Corporation Commission, chairman, reiterated this committee's previously expressed opinions in favor of private as distinguished from public ownership and operation. In discussing developments relating to railroads during the past year, it spoke as follows:

Nothing has occurred since the last report of your standing committee to alter the conclusions, successively reached by each committee since 1917, that the interests of the public are best served through private operation of public utilities. On the contrary, the events of the past year have strengthened and confirmed the conviction that private operation under proper public regulation is the best method yet devised for providing the public with efficient, economical and progressive service.

Your committee would direct attention to the steady improvement in railway operation since the roads were returned to their private owners. During the past year this improvement has been especially great. Operating economies have been achieved, which have resulted in net revenue gains in striking contrast to the huge deficits incurred during the period of government operation.

Even more important from the public viewpoint, increased operating effciency has reduced the costs of industry in general since quick and reliable transportation has enabled both the manufacturer and the retailer to reduce their inventories and to accommodate industrial production to public consumption.

It is safe to say that in this respect private operation of the railroads has returned indirect benefits to the American public even greater than the direct benefits secured through the prevention of public deficits and the collection of taxes, formerly foregone.

In this connection it is interesting to note the declaration of Major General B. F. Cheatham,, Quartermaster General of the United States Army, that in any future emergency the War Department now plans to rely upon the private operation of the railroads, without having recourse to government control except

as a last resort. From the standpoint of national efficiency, therefore, no less than from that of national deficits, the United States government is unwilling to repeat its experiment in government operation of the railroads, which has cost us the enormous sum of $1,600,000,000.

In former years your standing committee has adverted to the experience of other nations in government operation of public utilities. It has been pointed out that state operation of railroads has not demonstrated its superiority in any foreign country.

With the single exception of Prussia, state-owned railroads have been financial failures. The financial success of the Prussian railroads is due to high rates, which average about twice those of American railroads, despite the fact that the Prussian roads pay practically no taxes and that the American wages are double those of Prussia. Moreover, the operating costs of the Prussian roads are seriously and wastefully swelled in the item of labor costs, by the excessive number of employees. Where American railroads employ 100 men the Prussians employ approximately 166, an excess common everywhere under state operation. It takes 23 men in Prussia to move a ton of freight one mile, 24 men in Italy, 31 in Switzerland. In the United States it takes only five men. It is interesting to note also that, reduced to terms of bread and butter, railroad employees in these countries show weekly earnings of only about one-third of those in this country. Measured by our experience, by efficiency of service, by rate of wages paid, we have everything to lose and nothing to gain by public ownership. It would be a most perilous undertaking, both to the welfare of business and the independence of the people.

In general the rates on state-owned railroads in foreign countries are higher and their service poorer than those of privately operated railroads. Despite high rates and generally poor service, the state-owned railroads of Australia, New Zealand, Austria, Italy and France have to pay part of their fixed charges out of general taxation. The railroads of the three last-named are monuments of financial mismanagement. A minor part of the Australian lines was built in response to political pressure, and its revenues barely pay operating expenses. Canada's Intercolonial Railway, estimated to cost less than $40,000,000, actually cost more than $90,000,000. It likewise was built under political pressure. During forty years' existence it has seldom earned even operating expenses; and every year during its history the Canadian people have been taxed to meet its deficit.

During the past year additional evidence of the disadvantages of government operation of railroads comes from Jugo-Slavia and Belgium.

On July 4, last, Vasa Jonanovitch, minister of railways in Jugo-Slavia, declared emphatically for private operation. In a public statement he said:

"I believe that private initiative is the only way for the upbuilding of the country and I want to wean the people from paternalism, which has a strong grip here. We are too accustomed to expecting the state to own, construct and operate the public utilities, depending upon it for everything.

"I should like to see an American company directly build and exploit as a private business enterprise one of the railways we need. Such an example would open the eyes of our people. If they saw a private railroad more quickly and more cheaply built, and more cleanly, more comfortably and more efficiently run than the state railways, it would shake their belief in paternalism.

"The people would then ask for the adoption of the same principle for all new railroads, and perhaps its extension to the existing state lines. Certainly the comparison which private competition would offer would stimulate a better management of the state railways and allow reforms which are now difficult to obtain."

In 1923 the state-operated Belgian railways had a deficit of 301,000,000 francs; in 1924 a deficit of 550,000,000 francs, and in 1925 a deficit of 457,000,000 francs.

On July 13, 1926, the Belgian Chamber, in conferring dictatorial powers on King Albert, provided for private operation of the state-owned railways of Belgium as a measure of necessary national economy.

After experiencing the disadvantages of government operation of railroads, the American public is firmly set against any repetition of that experiment, which represents a closed chapter in our national development.

A Question of Expediency

Harley W. Brundige, president of the California Railroad Commission, and a member of the committee, presented a statement of dissent in which he said in part:

To me there is only one question to be determined in connection with public ownership. That question is one of expediency solely. The question can not be clearly stated until some concrete proposition is presented. The question is whether a particular job, under all the existing and surrounding conditions, can best be performed by public or private agency. Until all the conditions of time, place and circumstances are considered there can be no satisfactory answer to the question.

Abstract discussion of the relative merits of public and private ownership of utilities seems to be more or less meaningless. Any such discussion if devoid of detail necessarily must be unsatisfactory and determinative of nothing.

I sincerely trust that the association will not go on record as either favoring or opposing public ownership or operation of utilities as an abstract proposition. Particularly do I hope they may not be led into what seems to me to be an all too-common error of assuming that this question presents an issue where one must as a matter of principle choose one side or the other. As I see it, nothing further than economic expediency is involved and that scarcely can be dignified by being termed a vital principle.

The Railroad Rate Situation

Consideration was given in the report of the committee on railroad rates to the progress made or now being made in the reorganization of the freight rate structure in such cases as the southern class rate investigation, the consolidated southwestern cases, the eastern class rate investigation, the rate structure investigation made in accordance with the Hoch-Smith resolution, etc. The committee chairman was Frank P. Morgan of the Alabama Public Service Commission. In his absence the report was read by J. H. Alldredge, examiner, of the same commission. The report was a discussion of what had been so far done and it contained a plea that "A definite objective should be set which will be consonant with the public interest and in conformity with the law." The following is a selection of some of the more interesting paragraphs of the report:

In recent months the Interstate Commerce Act has been supplemented by the Hoch-Smith Resolution, which is framed in mandatory terms. The language of that resolution was a little baffling at first, but we think when the historic background of the resolution and the situation with which it was dealing are analyzed and considered that its intention becomes clear. Stated in plain and simple language, we think this resolution means this: That Congress, in the Transportation Act of 1920, having made elaborate provision for the maintenance of an efficient transportation system throughout the country, and having specifically assured the carriers of an adequate net return, in the aggregate, upon the fair value of their properties devoted to transportation service, it turned its attention to legislating for the immediate benefit of the public by directing the distribution of the total transportation burden necessary to maintain an efficient transportation system and to provide the cariers an adequate net return in such manner as to promote the development of commerce. The one dominating purpose of this resolution undoubtedly was to promote, to the fullest possible extent, the interests of commerce, since adequate provision had already been made for the development and maintenance of an efficient transportation system. This resolution makes it plain that in the moulding of our general rate structure and the consequent distribution of the total transportation burden consideration can and must be given, within the limitations of law which we have previously discussed, to such elements as the values of the different commodities entering into commerce, their economic importance and their ability to stand a transportation charge.

It is the duty of all regulatory authorities to accept and carry out both the letter and the spirit of the law. The right of the carriers to earn an adequate net return, in the aggregate, upon the fair value of their properties devoted to transportation service, has a constitutional background and the federal statue merely represents the mind and will of Congress as to the specific application of that constitutional guaranty. The statute has declared a public policy which, of course, becomes the law of the land within the sphere of its operation. The rights of the carriers with respect to their earning power have been reduced to definite and simple terms. We know that what they are entitled

to. The big problem left to the regulatory authorities lies in the distribution of the total burden that commerce must bear to support the transportation system. The public welfare is vitally concerned in this matter. It is easy to see that the carriers may be adequately taken care of in the aggregate, and yet at the same time that commerce may be stifled and throttled and even paralyzed by the manner in which the total transportation burden is distributed. It is this latter phase of the matter that calls for the exercise of the very best judgment of those charged with official responsibility. If we succeed in the task of distributing the transportation burden so that commerce may flow freely, industry flourish and the carriers receive what they are entitled to under the law we may write it down that we have performed a substantial service for the public.

In discharging their responsibilities the rate-making authorities must keep in mind the spirit as well as the letter of the law if the real, underlying purpose of the law is accomplished. We believe that the law, when its language and spirit are considered together, contemplates such a distribution of the total transportation burden among the different classes and descriptions of traffic as will place the least possible burden, within the limitations which we have previously mentioned, upon the lower-grade commodities or traffic essential to the agricultural, commercial and industrial activities of the people,—in other words, upon the basic commodities—and, if necessary to provide the required aggregate revenue for the carriers, more of the burden upon the higher-grade commodities or traffic, to the end that the transportation systems may be adequately supported and all commodities or traffic making up the commerce of the country permitted to move with the greatest possible freedom. A rate constitutes a more potent economic factor in the movement of low-grade or basic commodities than in the movement of higher-grade commodities or traffic. Congress having expressed in specific terms its desire that the carriers be adequately rewarded and commerce concurrently encouraged and promoted as much as possible, it is absolutely necessary that the most careful consideration be given to the effect of rates on the movement of all commodities. We know as an economic principle that a freight rate always offers greater resistance to the free movement of the lower-grade or basic commodities than it does to the higher grades, and this fact indicates what the general rate-making policy of the country should be. If we are to assure the fullest freedom of movement of our basic commodities, naturally the rate burden should be made to rest as lightly as possible, within legal limits, upon such commodities, and if it is necessary to raise more revenue to produce the required net aggregate earnings for the carriers, of course the only alternative is to place more of such burden on the higher-grade traffic.

Without offering any criticism of those responsible, we feel that we should call attention to the fact that the tendency so far in the reorganization of our rate structure has not exhibited a full and complete recognition of the principle we have adverted to. Increases have been made in rates on high-grade commodities without corresponding reductions in the low-grade or basic commodities even where the earnings of the carriers would permit this to be done. We hear much about making just and reasonable rates, but we will never accomplish the ideal of the law until we get our whole rate structure so constructed as to produce the aggregate revenues which the carriers are entitled to, and not substantially more, and permit the commerce of the country to move without the hampering restrictions that an improper distribution of the transportation burden always brings about.

Students of economics have discussed this matter frequently in recent years. We ought to take hold of it. It is not as baffling as might be imagined. Many lines of industry have called for relief at the hands of the regulatory authorities. Their chief hope in this respect, as a thorough analysis of the situation will disclose, lies in a better distribution of the total transportation burden. Rapid horizontal increases in rates since the war started have produced many inconsistencies and maladjustments in our rate structure and have disrupted to a large extent the ratios between producers and consumers upon which business and industry in this country have been predicated in the past, and a thorough examination into the manner in which the transportation burden is now distributed is vitally important. This particular phase of regulation, in our judgment, should receive more attention than it has received in the past. We think we may say further without violating the proprieties that the passage of the federal transportation act of 1920 has cast the responsibility of initiative in this matter upon the Interstate Commerce Commission. Coming as we do from all sections of the country and having the advantage of daily contact with the problems of industry at their source we believe this body is justified in stressing the importance of this subject and urging its most careful consideration by the national regulatory commission.

The greatest other issue in respect to rates of the railroads at this time, in our opinion, is a proper determination of the relationship between intrastate rates and interstate rates in cases involving this point.

We respectfully submit that in our view the only proper and reasonable order that should be entered in these cases by the Interstate Commerce Commission, in conformity with both the letter and the spirit of the Interstate Commerce Act, as construed by the Supreme Court, would be in substance to the effect that upon the facts proved the intrastate rates in question were shown and found to be unjustly discriminatory and unduly prejudicial, and therefore, that the regulatory body of the state should proceed promptly and within such reasonable time as the commission should designate, to revise such intrastate rates in such manner as would remove the unjust discrimination and the undue prejudice.

Such an order would carry out the intention of Congress as expressed in the act. It would leave the state commission with a reasonable measure of authority to prescribe such rates as would both remove the unjust discrimination and undue prejudice and at the same time provide such differences between the intrastate and the interstate rates as the state commission knew should be provided because of its closer relationship and better understanding of the local conditions and circumstances surrounding such transportation within the state, and yet would not create such disparity between the intrastate and interstate rates as any reasonably minded man could adjudge amounted to unjust discrimination or undue prejudice.

Unless the Interstate Commerce Commission modifies its present general practice in these cases and adopts some such reasonable rule as we have here undertaken to state, it is apparent, we think, that it will not be many years before the intrastate rate structure of the country will be so frozen by its orders that there can be no reduction of such intrastate rates, whether desired by the carriers or shippers, or by both, without bringing all such matters before the Interstate Commerce Commission.

Report of Committee on Grade Crossings and Trespassing

This is one of the reports that was presented at the last session and for which time was not offered for adequate discussion. The committee chairman was F. T. Singleton of the Indiana Public Service Commission. The report contained rather interesting views on the elimination of grade crossings by diversion of the highways, supplementing the suggestions made in the report of the committee on Safety of Railroad Operation. An abstract of the report follows:

The extraordinary expense attending grade separation tends to retard separation of grades. Your committee believes a plan should be adopted that will eliminate 50 per cent of the existing crossings at grade at an expense that will be negligible as compared with expense of the separation of grades. Your committee, therefore, recommends that a general and united effort be made to eliminate crossings at grade by the diversion of the railroad or the highway or both, as the necessities of each case demand.

Preparatory to a Street and Highway Safety Conference held in Indiana, October 12 and 13, 1926, the county surveyor in each of the 92 counties in Indiana was requested to furnish certain data of his county, a part of which was the number of crossings at grade of the public highway and the steam railroad or interurban railroad, outside of cities and towns having more than 700 population, in which the same highway recrossed the steam or interurban railroad within a distance of three miles. Replies were received from 72 of the county surveyors. The number of such crossings in the 72 counties of Indiana was 436. This information included state highways, county highways and township highways.

Three miles is a comparatively short distance. Such a short distance would render it convenient, practicable and comparatively inexpensive to divert the highway so that it and the railroad would parallel each other instead of crossing each other. This would remove all of the 436 existing crossings. For the sake of the argument, grant that private properties along the present three-mile stretches of highways would make it necessary for a crossing to be constructed to permit said property owners to reach the new highways proposed to be substituted for existing highways. That would mean a very short stretch of highway from the existing roads to the new roads, but it would also

mean that the new crossings thus made necessary would be at right angles rather than at acute angles. Thereby the number of such grade crossing would be reduced from 436 to 218 and grade crossings at right angles would be substituted for grade crossings at acute angles.

All states encourage crossings at right angles. All states discourage crossings at other than right angles. All drivers on public highways and all railroad enginemen and interurban motormen dread the crossings at acute angles and perfer the crossings at right angles. The reason for this is obvious—the hazard is reduced; the lives of both the highway travelers and of the railroad men are subjected to much less hazard.

Surely it can be agreed that cost of the diversion of the highway, as suggested above, would be negligible as compared with the cost of separation of grades. In each state the commission that has jurisdiction over grade crossings should be authorized by statute to receive and consider petitions for such diversion of highways and railroads, to initiate proceedings upon its own motion, and to allocate the cost of such diversion between the railroads, the public and the state, as the interest of each might appear from the evidence upon public hearing. Of course, such statutory provisions should apply to all crossings at grade, but the effort of commissions represented in this body should be directed especially and speedily to elimination by diversion in instances wherein the roads cross and recross each other. The greatest good to the greatest number, in the shortest time and at the least expense, can, in the opinion of your committee, be secured by stressing such effort.

The committee made the following specific recommendations:

The efforts of the various commissions represented by membership in this association should be to secure legislation in their several states, to make possible and practicable the plan of elimination by diversion. These laws of the several states should be as nearly uniform as the conditions in each state will permit.

The commission having jurisdiction over grade crossings in each state should be empowered to declare a hazardous crossing to be hazardous, to require travelers upon the highway to stop before crossing, to require stop signs to be placed there and to require such stop signs to be illuminated at night.

All automobilists should be required to approach unprotected grade crossings with their machines in intermediate.

Steep grades, narrow roadways and defective surface on roadways at approaches to grade crossings should be eliminated. At such crossings the roadway should be level with the railroad grade for at least fifty feet on either side of the nearest rail of the railroad track.

Obstructions to view within 300 ft. of grade crossings should be forbidden.

Poor view by reason of unavoidable natural or business conditions should be compensated by adequate crossing protection, same to be determined by the character of the impediment and the volume and speed of traffic on both the highway and the railroad, or either.

The state commission having jurisdiction over grade crossings should be authorized by law to exercise the right of eminent domain or to compel the exercise of it in condemnation of obstructions to view.

The state should be required to participate in the public's portion of cost of separation or elimination in proportion to the congestion of travel caused by other than local and adjacent community use.

All orders promulgated by such commissions should be upon public hearing and should be enforcible by the legal department of the state.

All orders of such commissions should be subject to re-review by courts of competent jurisdiction.

This association should draft a model bill upon its recommendations for submission to the proper commission in each state, with the suggestion that it be presented to the legislature in each state for modification to meet conditions therein and for enactment into law.

Education in Problems of Public Utility Regulation

The report of the committee on public relations, Ernest I. Lewis, I. C. C. chairman, was to have been made the subject of a round table discussion, but in the absence of Mr. Lewis this did not take place. The committee's report was based on a survey made of the efforts made in the schools and colleges to acquaint students with the activities of the transportation and other public utility companies and with the efforts of the public authorities in connection with public utility control. The committee found that education along such lines was discouragingly inadequate and made recommendations looking to an improvement in the situation.

Submitted with the report was a collection of letters received from various state commissioners relative to present methods of education on the subject of public regulation in their respective states.

Statistics and Accounts

The report of the Committee on Statistics and Accounts of Railroad Companies discussed principally the revision, now in progress, of the Interstate Commerce Commission accounting classifications. It included an argument in favor of the inclusion of some form of cost accounting and a plea for the separation of accounts and statistics by states. Because of the present interest in the subject, it will be published in the *Railway Age* as a separate article.

Election of Officers

The following officers were elected for the ensuing year: President, John F. Shaughnessy, chairman of the Nevada Public Service Commission; first vice-president, Henry G. Wells, Massachusetts Department of Public Utilities, and second vice-president, Lewis E. Gettle, chairman of the Wisconsin Railroad Commission. James B. Walker, secretary of the New York Transit Commission, was re-elected secretary of the association, and Clyde S. Bailey was re-elected assistant secretary. John E. Benton was re-elected general solicitor.

It was decided after a lengthy discussion to hold the 1927 annual meeting at Dallas, Tex., the third week in October.

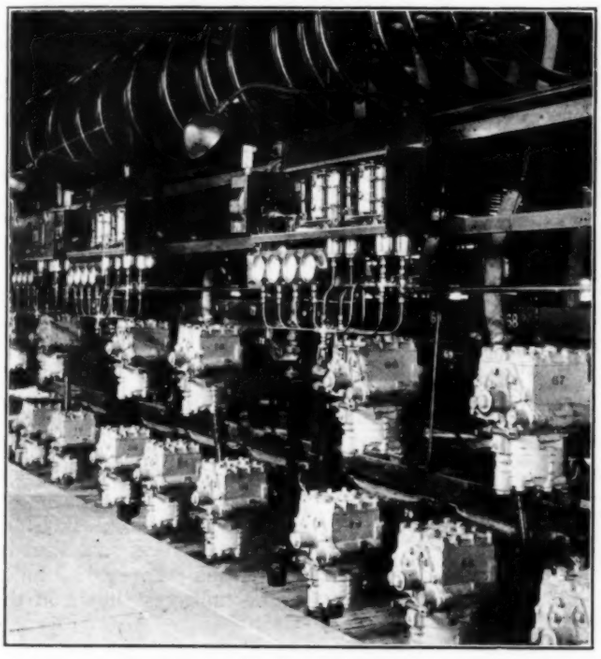
A Ticket Office Without a Counter

Office of M. M. Hubbert, General Eastern Passenger Agent of the Great Northern, 595 Fifth Avenue, New York City

Railway Men Study Air Brake Tests

MORE than 150 railroad men from all parts of the United States and Canada met at Purdue University, Lafayette, Ind., on November 12, to witness demonstration tests made on the freight train brake equipment submitted by the Automatic Straight Air Brake Company. The investigation under way at Purdue is being conducted by the American Railway Association for the purpose of obtaining more economical operation of trains and of promoting safety for the public and railroad employees. Specifically, the investigation is to determine which brake is the most efficient and economical, as well as the safest, for stopping heavy freight trains.

This is the most extensive and thorough investigation which has ever been attempted in the history of power brakes for railway trains. Several new systems



Automatic Straight Air Brake Equipment on the Purdue Test Rack

of brakes have been designed and constructed and are being subjected to these tests to determine if they are better adapted to railway service conditions than the brakes now in general use. The tests are being conducted in a special laboratory, fitted up by the American Railway Association, which contains the entire air brake equipment for the largest type freight locomotive and 100 cars. The tests have been going on continually for a year and will continue for another year or longer before any conclusions can be reached.

As a result of hearings held by the Interstate Commerce Commission about two years ago in the matter of power brakes and power brake appliances, the tests now being conducted at Purdue University were undertaken under the direction of H. A. Johnson, director of research, A. R. A. The basic schedule of rack tests for freight equipment, which began on November 30, 1925, is as follows:

Series No. 1—Run standard K triple valves through schedule of tests in order to determine the exact functions of present standard brakes for a basis of comparison with the new brake systems which will be tested.

Series No. 2—Install heavier-than-standard graduating springs in all K triple valves and determine the effect of these springs upon the functioning of the K triple valves.

Series No. 3—Run Automatic Straight Air Brake equipment through the schedule of tests.

Series No. 4—Repeat schedule of tests for a train of 100 cars with mixed equipments of standard K triple valves and Automatic Straight Air Brake equipments.

Series No. 5—Run new Westinghouse equipments through the schedule of tests.

Series No. 6—Repeat schedule of tests for a train of 100 cars with mixed equipments of standard K triple valves and new Westinghouse equipments.

Series No. 7—If it is found advisable, after completing the six series of tests given above, repeat tests of Series No. 4 or Series No. 6 with mixed equipments of standard type K triple valves Automatic Straight Air Brake equipments and new Westinghouse equipments.

Series No. 8—Install the three-position 10-20-lb. duplex spring type retaining valves, with which the pressure will blow down from a 10-in. cylinder with 8-in. piston travel, or a volume of 640 cu. in., from 55 lb. to 25 lb. in 85 to 95 sec. when in high pressure position and will blow down from 45 lb. to 15 lb. in 45 to 55 sec. when in the low pressure position, and determine the effect of the blow-down time in the high pressure position on the cylinder pressure obtained with the standard type K triple valve.

The tests made on November 12 were typical of Series No. 3, now in progress, No.'s 1, 2 and 8 having been completed, and were made to give the visiting railroad men an opportunity to inspect the equipment and method of proceedure used in conducting the investigation. The equipment now on test was submitted by the Automatic Straight Air Brake Company and was designed to meet the tentative specifications for power brakes issued by the I.C.C.

A schedule of informal tests was made for the general observation of the new equipment with respect to graduated release, maintenance of brake cylinder pressure, the ability to obtain emergency pressure at any time, and uniformity of brake cylinder pressure independent of piston travel, which are features claimed for the equipment.

In order to obtain accurate information concerning the functions of all the air brake equipment tested and to be able to compare the data collected on standard type K equipments and the new types submitted a complete system of analyzing the data from observation and trainagraph records has been installed.

Assisting Mr. Johnson in this work are A. A. Potter, dean of engineering and director of the Purdue University Engineering Experiment Station; G. A. Young, professor of mechanical engineering; W. S. Helmer, representing the A.R.A.; Harry Rubenkoenig, professor of railway engineering, and a large staff of engineers who perform the tests and tabulate and record the data. When the air brake investigation is completed definite statements can be made as to the desirability of new types of brakes as recommended by the I.C.C., the economy of proposed changes and the feasibility of making new installations of newer types of brakes.

THE CHICAGO, MILWAUKEE & ST. PAUL on December 20, will establish through rates on wheat and flour from points in Montana to California by way of the Columbia basin and Portland, Ore., the rates to be in equality with those by way of Puget Sound.

Mechanical Division to Meet in Montreal in 1927

THE general committee of the Mechanical Division of the American Railway Association at a meeting held in New York on November 18 decided to hold the 1927 annual meeting at Montreal, Que., on June 7, 8 and 9 with no exhibits of railway appliances or machinery. This decision was reached as a result of an invitation from the executives of the two large Canadian railway systems, which are members of the Association and whose officers have been members of its predecessors since 1867. During the history of these organizations no convention of any of them has previously been held in Canada. The meeting in Montreal next year will coincide with the induction of G. E. Smart, chief of car equipment of the Canadian National, now vice-chairman of the division, into the office of chairman, to which he will succeed in the ordinary course of events at the next meeting of the division.

A. G. Trumbull, chief mechanical engineer of the Erie, was elected a member of the general committee to serve for the unexpired term of W. H. Fetner, deceased.

Block Signal Mileage Statement

THE Interstate Commerce Commission has issued its annual bulletin, prepared by the Bureau of Signals and Train Control Devices, showing the mileage of railroad in the United States operated under the block system on January 1, 1926, together with data concerning the use of telephones and automatic train control devices.

The total length of railroad in the United States operated under the block system was 110,824.6 miles; 45,596.9 miles automatic and 65,227.7 miles non-automatic. There was in the 12 months an increase of 1,758.1 miles automatic and 976.6 miles non-automatic, making the total increase 2,734.7 miles of road. In the year ending January 1, 1925, there was a slight decrease in manual block signaling and a total net increase, both kinds, of 2,188 miles; as compared with a total increase, now reported, of 2,735 miles.

The bulletin contains the usual tables of details showing mileage of each kind on each road, kind of signals in use, etc.

TABLE A—PRINCIPAL INCREASES SHOWN IN DETAIL TABLE

Name of road	Increase, miles of road: Automatic	Increase, miles of road: Non-automatic	Decrease Non-automatic
Atchison, Topeka & Santa Fe	302.1	....	228.2
Atlantic Coast Line	77.9	37.6	....
Western of Alabama	33.4	....	....
Baltimore & Ohio	12.9	7.6	....
Central of New Jersey	38.0	....	....
Chesapeake & Ohio	....	75.6	....
Chicago & North Western	9.6	....	68.2
Chicago, B. & Quincy	142.7	....	142.7
Chicago, M. & St. Paul	....	....	215.9
Great Northern	269.4	....	....
Louisville & Nashville	172.0	....	53.5
Minneapolis, S. P. & S. S. M.	....	....	530.2
Missouri Pacific	30.5	....	29.5
Mobile & Ohio	8.8	....	8.8
New York Central System	107.8	....	197.2
New York, N. H. & Hartford	....	....	67.3
Central New England	....	....	11.0
Norfolk & Western	129.9	....	129.9
Pennsylvania System	32.8	....	66.4
Reading	11.1	....	11.1
Rutland	....	161.6	....
Seaboard Air Line	53.0	2,087.4	....
Southern	72.5	....	72.5
Southern Pacific System	234.8	534.3	....
Union Pacific System	33.6	....	2.6
Wabash	44.8	....	43.1
Western Maryland	....	....	22.4

The principal increases and decreases in mileage in 1925, as noted in the bulletin, are shown in Table A.

The bulletin has a table supplementary to Table 2, showing roads on which light signals were in use on January 1, 1926. This table shows the totals as given below; and a second column has been added to facilitate comparisons with the preceding year.

The total mileage of light signals on January 1, 1926, was 4,681 (color light, 3,978; position light and color position light, 703 miles.) The totals on January 1, 1925, were 3,207 and 422; and one year before that, 2,167 and 227. The total given by the A. T. & S. F. in January, 1926, includes 101 miles of cab signals. The statement from the Pennsylvania records 43.5 miles of cab signals in addition to the mileages shown in the table.

LIGHT SIGNALS IN USE ON AMERICAN RAILROADS

[Including all companies on which, according to the Interstate Commerce Commission's report, these signals were in use on at least ten miles of road. All items represent color-light signals, except those indicated by "p" position light and "cpl" color position light].

Name of road	1926 Miles of Road	1925 Miles of Road
Atchison, Topeka & Santa Fe	422	388
Baltimore & Ohio	42 cpl	...
Central of New Jersey	66	...
Chesapeake & Ohio	82	131
Chicago & North Western	54	44
Chicago, Burlington & Quincy	277	179
Chicago, Milwaukee & St. Paul	570	596
Chicago, R. I. & Pacific	8 cpl	...
Delaware, L. & W.	14	9
Fort Dodge, D. M. & S.	17	17
Great Northern	833	557
Illinois Central	320	315
Indiana Service Corporation	50	50
Lehigh Valley	42 p	29 p
Louisville & Nashville	47	31
Massachusetts Northeastern Street	66	65
Monongahela	10 p	10 p
New York Central	307	141
Boston & Albany	10	4
Michigan Central	44	...
Pittsburgh & Lake Erie	10 p	10
N. Y., Chicago & St. L.	12 cpl	10 cpl
Norfolk & Western	237 p	107 p
Ohio Valley Electric	17	11
Pacific Coast Railroad	13	13
Pacific Electric	29	29
Pennsylvania	13	16
Pennsylvania	303 p	250 p
Pere Marquette	18	18
Raritan River	12	12
San Francisco-Sacramento	85	85
Seaboard Air Line	53	...
Southern	100	84
Southern Pacific	67	20
Terre Haute, Ind., & Eastern	60	60
Union Traction of Indiana	82	82
Wabash	23 cpl	...
Washington, Baltimore & Annapolis	50	50
Wheeling Traction	52	52

Table No. 7 shows the status of automatic train control apparatus on the railroads of the country on April 1, 1926. The totals are: miles of road to be equipped, 4,460; miles of road already equipped, 3,124; locomotives to be equipped, 3,893; locomotives all ready equipped, 1,809.

The length of railroads on which the telephone is used for the transmission of train orders is 139,960 miles, an increase of 7,110 miles over the year preceding. The total miles of road on which train orders are sent by telegraph, 118,628, is 2,893 miles less than the year before. These figures concerning the telegraph and telephone come from roads operating 247,485 miles of line.

PENNSYLVANIA.—Work has just been started by this company on the elimination of four grade crossings over its main and branch line tracks at Manor, Westmoreland county, Pa., twenty-four miles east of Pittsburgh. This grade crossing elimination work and improvements incident thereto will cost $190,000. The improvements at Manor will include the construction of two railroad bridges to make undergrade crossings, the relocation of a street to avoid an oblique crossing of the tracks, the building of several new streets and the rearrangement of station platforms to meet the changed traffic conditions.

General News Department

Pullman conductors and porters are being awarded stock in the company for acts of heroism and bravery in line of duty.

T. L. Burton, air brake engineer of the New York Central, has been made acting secretary of the Air Brake Association, with headquarters at 165 Broadway, New York, in place of F. M. Nellis, deceased.

Reservation of a tract of public land along the right of way of the Alaskan Railroad for the purpose of supplying timber to the road was revoked in an executive order issued on November 17 on the recommendation of the Secretary of the Interior. The tract includes a strip 5 miles wide on each side of the railroad extending from Seward, Alaska, to the Knik river. Recently the manager of the railroad reported that there was very little timber within the area suitable for railroad replacement.

Correction

In the *Railway Age* of November 6, page 907, reference was made to a new record in tunnel driving in which the statement was made that 1,157 ft. of heading was driven during the **week** ending October 31. This statement was incorrect since this record was made during the **month** ending October 31. It compares with a record of 984 ft. made in the same tunnel in the **month** ending September 30.

An "Expurgated" Brief on W. & L. E. Valuation

An "expurgated" brief of 422 pages has been filed with the Interstate Commerce Commission by attorneys for its Bureau of Valuation in the case involving the valuation of the properties of the Wheeling & Lake Erie and its subsidiary companies, in accordance with a recent ruling by Division 1 of the commission which ordered stricken from the commission's files both the brief of the bureau attorneys and the reply brief filed on behalf of the railroad company on the ground that they contained "scandalous and disrespectful" language. The expurgated brief is a copy of the original with strips of paper pasted over numerous passages to which the railroad lawyers objected in their reply brief.

Safety Program for December

L. G. Bentley, chairman, has issued circular No. 136 of the Safety Section, A. R. A., setting forth the program for the month of December in the campaign, supervised by the committee on education, to make a reduction of 35 per cent in the number of railroad employees killed and injured between 1924 and 1930.

In December, the safety departments are requested to consider tables 90 and 76 of the I. C. C. bulletins, which show the number of employees killed and injured from (a) electric currents and (b) from coming in contact with fixed structures at the side of the road or overhead. Illustrations are given of typical dangerous practices in the two fields mentioned. The erection of temporary fixed structures too close to the track is one of the bad practices illustrated by a picture.

Pennsylvania Eliminates Angle Cocks from Passenger Equipment

The Pennsylvania, after conducting a number of tests at Harrisburg, Pa., and other important terminal points on its system, is now operating its passenger equipment with the handles of the brake pipe angle cocks clamped in open position. The elimination of the angle cocks is a radical change in air brake equipment. The time set for the application of the clamp to all angle cocks on passenger equipment was 12:01 a. m., October 1, instructions being given that this work should be completed within a period of 72 hrs. It is reported that there have been no delays to passenger trains on account of the angle cocks being clamped, since the general order went into effect. This action was taken by the management as a further step to promote safety of passengers and employees. The brake pipe is closed at the rear end of the last car of the train with a dummy coupling.

Consolidation Legislation Urged

Legislation to amend the consolidation provisions of the transportation act was urged in a statement on current economic problems placed before President Coolidge on November 15 by J. W. O'Leary, president of the Chamber of Commerce of the United States, and Robert R. Ellis, southern vice-president of that organization. On this subject the statement said:

"It is generally accepted that some degree of railroad consolidation is desired. Under the present laws there are serious obstacles to such consolidation, such as are found in connection with valuations, minority stockholders, short or weak lines. Congress might well modify the laws so that the Interstate Commerce Commission can approve proper consolidations and thus assure to the public effective and reasonable railroad transportation. The National Chamber is convinced that it is practicable to remove these obstacles by legislation and that such action will constitute one of the most important activities which the coming Congress can take."

Special Studies for Pullman Shopmen

The Pullman Car & Manufacturing Corporation, during the winter months, is giving a course of training in production methods to approximately 1,000 employees in both the Pullman (Ill.) and Michigan City (Ind.) plants. The course is specifically and definitely a car building course based largely upon the experience of the executives of both plants and consists of six units, (1) team leadership; (2) handling men; (3) handling equipment; (4) organization; (5) plant records; and (6) management. Each unit can be read easily in a few hours and is accompanied by a shop problem. Each unit is used as a basis for departmental meetings in which principles are applied directly to each man's work. In addition, a lecture is given in which the principles can be clarified and application to special problems brought out. A general meeting will be held at four-week intervals and these will be supplemented by four smaller meetings. Departmental meetings are held one week before the general meetings.

Pullman Employees Instructed in First Aid

Nearly 600 Pullman Company employees have either received Red Cross certificates for graduation in the first aid course or are now in training. The purpose of the course, which was inaugurated several weeks ago, is to teach men to think in terms of physical suffering, to cause them to view unusual situations in terms of safety, to create a tendency to put one's self mentally in the victim's position and to induce the pupil to study how to keep himself from being involved in an accident; to impel a man to analyze his particular job, and to urge men to take more interest in their physical well-being. A class of 25 safety supervisors, yard men and porters were first given a special course in Chicago, and these men later organized classes in New York, Chicago, Washington, Buffalo and San Francisco.

The course requires 15 hours' time from each pupil; or 1½ hours a week for 10 weeks. The Pullman Company furnishes instructors, material, text-books, etc., free. Technicalities are

(*Continued on page* 1010)

Freight Operating Statistics of Large Steam Roads—Selected Items for September, 1926,

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross, Excluding locomotive and tender	Ton-miles (thousands): Net, Revenue and non-revenue	Average number of locomotives on line: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany	1926 407	219,461	236,627	26,713	5,200	69.2	268,604	106,348	103	19	15.6	8
	1925 404	229,859	254,098	34,501	5,043	70.3	252,912	97,955	119	18	13.0	4
Boston & Maine	1926 2,143	462,730	533,693	48,780	13,248	73.6	650,892	272,901	304	96	24.0	43
	1925 2,253	501,094	573,835	55,769	13,020	73.0	634,130	259,043	350	84	19.4	61
N. Y., New H. & Hartf.	1926 1,892	489,426	510,232	30,426	14,451	71.6	727,375	307,220	278	52	15.9	26
	1925 1,892	459,946	479,315	32,020	13,173	71.5	646,198	264,572	288	52	15.4	38
Great Lakes Region:												
Delaware & Hudson	1926 875	367,336	496,864	53,959	10,965	68.4	682,067	349,739	247	36	12.7	77
	1925 875	307,347	423,822	47,191	8,410	66.3	516,398	255,130	244	36	13.0	99
Del., Lack. & Western	1926 999	579,628	674,080	87,056	19,271	71.7	1,066,403	480,807	260	45	14.9	19
	1925 993	499,558	565,808	67,377	15,707	71.2	816,610	334,881	298	54	15.3	85
Erie (inc. Chic. & Erie)	1926 2,323	1,082,276	1,192,177	155,351	42,861	68.0	2,500,072	1,082,435	569	107	15.8	118
	1925 2,325	936,390	1,033,782	126,590	36,400	65.3	2,083,144	829,931	620	97	13.5	219
Lehigh Valley	1926 1,346	601,973	665,997	85,085	19,678	67.5	1,156,697	537,127	394	90	18.5	53
	1925 1,346	509,717	562,128	84,079	16,568	68.8	913,137	398,423	418	82	16.5	103
Michigan Central	1926 1,835	590,290	605,565	20,726	20,163	63.6	1,114,571	415,774	258	45	14.9	59
	1925 1,826	551,239	569,780	16,559	19,319	65.0	1,006,196	378,377	305	46	13.2	112
New York Central	1926 6,482	2,080,161	2,365,627	167,106	81,908	64.3	4,920,618	2,175,945	1,183	296	20.0	322
	1925 6,478	2,094,051	2,348,162	168,721	78,190	63.2	4,746,679	2,067,972	1,171	349	23.0	277
New York, Chic. & St. L.	1926 1,665	663,990	671,127	8,540	21,866	69.5	1,156,495	456,659	238	54	18.3	43
	1925 1,669	638,292	649,378	8,061	20,521	67.4	1,106,721	439,478	234	68	22.5	44
Pere Marquette	1926 2,179	479,129	489,080	7,455	12,285	65.5	711,214	309,653	189	30	13.7	10
	1925 2,198	424,612	436,458	7,580	11,003	67.4	612,274	278,884	189	20	9.4	20
Pitts. & Lake Erie	1926 231	133,556	134,661	1,465	4,914	66.1	373,143	219,368	67	15	18.6	21
	1925 231	120,720	122,556	1,065	4,169	66.1	304,811	175,890	72	17	18.9	34
Wabash	1926 2,497	749,921	778,488	11,821	24,364	70.6	1,315,230	549,092	331	52	13.6	50
	1925 2,497	692,211	724,911	13,520	22,770	71.5	1,219,720	512,747	328	57	14.9	64
Central Eastern Region:												
Baltimore & Ohio	1926 5,197	2,058,171	2,392,408	187,387	62,976	64.2	4,099,389	2,017,857	1,029	196	16.0	58
	1925 5,196	1,946,717	2,288,271	172,829	59,030	64.9	3,796,895	1,875,317	1,012	252	19.9	67
Central of New Jersey	1926 691	272,121	293,769	33,055	8,343	60.9	539,402	258,719	213	48	18.4	42
	1925 691	249,953	276,645	36,300	6,351	64.3	375,185	174,521	243	33	12.0	58
Chicago & Eastern Ill.	1926 945	263,688	264,543	3,656	7,819	65.5	467,454	220,256	131	40	23.4	45
	1925 945	236,174	237,594	3,545	7,104	66.0	413,086	196,783	144	23	13.5	63
Clev., Cin., Chic. & St. L.	1926 2,374	763,199	806,611	21,396	25,156	63.6	1,601,430	766,282	352	68	16.1	46
	1925 2,381	749,718	790,661	24,931	24,524	63.5	1,564,755	751,245	350	75	17.6	35
Elgin, Joliet & Eastern	1926 460	126,716	134,226	4,961	3,760	66.2	281,344	150,752	74	18	19.9	1
	1925 460	121,172	127,649	4,768	3,867	67.0	284,391	152,034	78	20	20.5	3
Long Island	1926 393	47,754	52,934	13,744	766	59.9	47,019	18,870	44	13	22.3	...
	1925 393	47,722	51,629	12,225	619	58.1	38,743	14,814	42	12	22.4	...
Pennsylvania & System	1926 10,883	4,848,676	5,295,851	412,993	147,713	66.0	9,606,627	4,665,414	2,786	471	14.5	335
	1925 10,881	4,521,213	4,896,018	365,593	135,125	65.3	8,762,613	4,202,365	2,686	696	20.6	298
Reading	1926 1,129	617,823	677,279	67,414	17,827	63.3	1,218,118	634,999	367	59	13.8	76
	1925 1,132	582,561	639,783	65,237	15,670	61.4	1,052,104	530,773	393	84	17.5	155
Pocahontas Region:												
Chesapeake & Ohio	1926 2,650	1,240,152	1,307,588	45,112	42,451	58.3	3,387,879	1,877,129	535	104	16.3	25
	1925 2,627	1,210,366	1,263,450	41,033	38,849	56.9	3,069,563	1,660,489	490	97	16.6	17
Norfolk & Western	1926 2,231	963,199	1,186,236	52,267	35,145	59.9	2,952,779	1,642,277	565	56	9.0	101
	1925 2,231	898,815	1,103,745	37,016	30,689	61.0	2,537,720	1,389,466	590	58	9.0	137
Southern Region:												
Atlantic Coast Line	1926 4,931	709,657	719,802	11,711	18,932	65.1	1,040,279	421,984	447	50	10.1	100
	1925 4,900	808,218	842,761	14,974	20,874	66.8	1,145,697	480,777	378	65	14.7	35
Central of Georgia	1926 1,905	332,474	337,248	7,545	8,214	72.0	441,857	198,183	154	20	11.3	4
	1925 1,907	380,263	385,256	6,108	8,707	74.0	462,841	215,098	150	12	7.6	21
I. C. (inc. Y. & M. V.)	1926 6,555	1,990,653	2,011,431	44,683	57,627	64.9	3,594,896	1,566,617	746	100	11.8	5
	1925 6,555	1,942,584	1,957,654	40,716	56,781	66.2	3,447,289	1,530,228	767	115	13.0	21
Louisville & Nashville	1926 5,021	1,736,252	1,823,978	55,176	35,974	61.8	2,454,507	1,217,754	597	111	15.7	12
	1925 5,027	1,852,372	1,979,191	60,222	36,086	61.4	2,434,043	1,197,459	591	102	14.7	7
Seaboard Air Line	1926 3,904	506,849	521,771	7,382	13,491	67.2	743,193	317,094	258	32	11.0	24
	1925 3,752	557,471	577,251	12,197	14,348	67.2	784,059	328,394	234	21	8.1	1
Southern Railway System	1926 8,050	1,994,143	2,031,369	36,789	50,967	68.8	2,775,163	1,174,687	1,078	176	14.0	46
	1925 8,157	2,063,316	2,117,792	40,749	51,568	69.7	2,771,281	1,173,483	1,050	156	12.9	78
Northwestern Region:												
Chic. & North Western	1926 8,457	1,625,281	1,698,986	27,905	42,534	63.9	2,451,300	1,020,816	752	149	16.5	105
	1925 8,469	1,590,216	1,645,482	27,885	41,163	66.0	2,350,945	950,939	739	205	21.7	76
Chic. Milw. & St. P.	1926 11,175	1,769,837	1,880,939	103,988	52,482	63.4	3,051,901	1,301,712	867	170	16.4	153
	1925 11,201	1,745,092	1,862,556	97,788	52,590	64.7	3,052,103	1,342,814	909	190	17.3	105
Chic., St. P., Minn. & Om.	1926 1,724	318,857	346,697	14,985	6,755	67.7	367,049	154,277	164	30	15.6	2
	1925 1,819	341,954	363,743	14,639	7,157	72.8	373,879	162,822	170	37	17.9	2
Great Northern	1926 8,138	1,144,384	1,183,029	65,680	41,891	59.9	2,746,995	1,270,224	587	126	17.7	72
	1925 8,232	1,165,270	1,200,252	56,590	40,427	60.6	2,592,761	1,205,293	608	143	19.1	50
M., St. P. & S. Ste. M.	1926 4,372	570,268	584,291	4,758	14,916	68.2	818,330	381,154	301	29	8.7	14
	1925 4,372	733,022	753,921	7,127	18,529	65.5	1,048,845	501,274	303	39	11.4	4
Northern Pacific	1926 6,510	953,341	1,010,193	56,140	32,263	69.0	1,774,745	765,571	512	131	20.4	61
	1925 6,522	1,063,717	1,119,422	55,819	34,254	70.4	1,942,223	886,475	538	123	18.6	58
Oreg.-Wash. R. R. & Nav.	1926 2,161	235,252	250,643	23,777	7,141	71.1	416,812	193,107	143	22	13.2	8
	1925 2,185	232,434	252,050	29,914	6,888	69.1	397,489	189,303	145	21	12.4	6
Central Western Region:												
Atch., Top. & S. Fe (incl. P. & S. F.)	1926 10,244	2,061,083	2,276,619	159,416	71,302	66.7	4,114,068	1,665,777	838	129	13.4	86
	1925 10,045	1,881,914	2,085,606	179,079	65,453	68.1	3,707,806	1,285,866	829	158	16.0	152
Chicago & Alton	1926 1,022	346,669	394,961	7,238	8,933	64.6	520,017	203,527	139	22	13.7	22
	1925 1,022	313,315	342,982	4,475	7,867	61.7	485,941	198,575	131	26	16.6	23
Chic., Burl. & Quincy	1926 9,349	1,668,603	1,734,223	70,637	51,444	52.3	3,012,707	1,330,184	798	194	19.6	65
	1925 9,338	1,625,754	1,696,753	70,214	49,119	63.4	2,886,335	1,307,304	813	196	19.4	71
Chic., Rock I. & Pacific	1926 7,572	1,287,198	1,327,874	15,643	33,680	68.2	1,827,555	765,759	542	142	20.7	78
	1925 7,561	1,346,379	1,402,348	14,563	34,261	66.4	1,889,945	782,767	555	158	22.2	53
Denver & R. G. Wn.	1926 2,575	348,513	422,680	81,867	9,592	68.7	541,400	228,188	252	36	12.5	18
	1925 2,577	327,111	392,349	74,335	8,936	69.4	506,225	222,713	262	42	13.7	31
Oregon Short Line	1926 2,537	384,782	419,877	39,751	11,538	66.8	673,315	272,385	197	21	9.7	29
	1925 2,444	410,540	428,609	25,679	11,402	65.2	681,203	293,280	197	29	12.6	31
Sou. Pac.—Pac. Lines	1926 8,625	1,731,182	1,895,275	303,256	54,700	65.5	3,235,047	1,192,792	795	174	18.0	55
	1925 8,511	1,765,642	1,950,685	350,606	55,360	65.2	3,281,726	1,259,923	786	159	16.9	38
Union Pacific	1926 3,694	1,524,095	1,562,513	82,085	56,812	67.5	3,194,889	1,102,399	491	40	7.6	83
	1925 3,688	1,424,239	1,468,970	111,684	53,248	68.6	2,911,957	1,037,036	499	55	9.9	119
Southwestern Region:												
Gulf, Colo. & S. Fe	1926 1,897	353,241	375,507	10,463	10,716	60.4	691,977	304,837	135	17	11.0	8
	1925 1,897	273,094	281,079	6,048	8,351	64.6	484,546	202,575	126	20	13.6	24
Mo.-Kans.-Tex.	1926 1,787	259,640	260,858	4,191	9,700	63.6	540,600	210,254	96	26	21.0	25
	1925 1,787	257,916	258,013	2,774	9,168	61.5	521,711	198,872	112	23	16.7	33
Mo.-Kans.-Tex. of Tex.	1926 1,389	197,873	205,833	3,587	5,759	65.1	322,311	134,177	102	32	23.9	38
	1925 1,389	183,663	192,276	3,127	5,074	61.1	283,692	106,078	133	13	9.1	64
Missouri Pacific	1926 7,288	1,466,391	1,520,698	48,418	42,512	67.1	2,420,415	1,039,655	565	84	12.9	...
	1925 7,278	1,391,105	1,430,385	44,369	39,077	66.7	2,233,190	959,034	557	89	13.8	6
St. Louis-San Francisco.	1926 4,895	834,059	853,667	14,972	20,845	64.3	1,215,148	501,245	438	57	11.6	71
	1925 4,819	905,315	927,204	13,152	20,518	63.6	1,187,705	486,680	425	72	14.4	18
Southern Pacific Lines (in Tex. and La.)[1]	1926 4,469	711,212	712,031	3,345	16,890	59.6	921,004	375,714	275	59	17.7	51
	1925 4,427	721,849	722,041	4,381	16,903	67.0	944,279	393,298	265	57	17.6	36
Texas & Pacific	1926 1,953	269,564	269,564	592	7,861	65.9	441,662	169,221	149	35	19.1	24
	1925 1,953	324,136	324,136	2,953	8,457	64.2	481,796	189,839	147	41	21.6	15

[1]Includes Franklin & Abbeville, Galveston, Harrisburg & San Antonio, Houston & Shreveport, Houston & Texas Central, Houston East & West Texas, Iberia & Vermilion, Lake Charles & Northern, Louisiana Western, Morgan's La. & Tex. R. R. & S. S. Co., and Texas & New Orleans.

Compared with September, 1925, for Roads with Annual Operating Revenues Above $25,000,000

Region, road and year	Average number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotive and tender	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles including locomotive and tender	Locomotive miles per locomotive day
New England Region:													
Boston & Albany....1926	2,310	5,606	7,916	4.4	15,074	1,224	485	20.5	448	31.6	8,712	167	71.9
1925	2,221	6,431	8,652	2.8	14,092	1,100	426	19.4	377	27.6	8,079	178	70.4
Boston & Maine.....1926	12,429	15,066	27,495	7.6	14,791	1,407	590	20.6	330	21.8	4,244	125	48.6
1925	12,715	14,102	26,817	9.7	13,552	1,265	517	19.9	321	22.1	3,833	132	48.4
N. Y., New H. & Hartf..1926	17,502	21,618	39,120	17.7	17,240	1,486	628	21.3	262	17.2	5,413	115	54.6
1925	19,788	20,090	39,878	21.4	15,762	1,405	575	20.1	221	15.4	4,662	125	50.0
Great Lakes Region:													
Delaware & Hudson....1926	7,767	6,970	14,737	5.2	22,268	1,857	952	31.9	791	36.3	13,320	148	64.8
1925	9,610	6,264	15,874	6.8	20,648	1,680	830	30.3	536	26.6	9,717	166	56.0
Del., Lack. & Western...1926	13,563	10,394	23,957	4.5	21,885	1,840	830	24.9	669	37.4	16,038	133	83.0
1925	16,210	9,323	25,533	3.2	19,981	1,635	670	21.3	437	28.8	11,246	153	59.9
Erie (inc. Chic. & Erie)..1926	31,031	24,268	55,299	8.0	26,897	2,310	1,000	25.3	652	38.0	15,533	119	66.4
1925	35,531	22,460	57,991	8.5	25,285	2,225	886	22.8	477	32.1	11,896	119	53.9
Lehigh Valley 1926	20,409	11,475	31,884	6.6	24,795	1,922	892	27.3	562	30.5	13,307	140	51.8
1925	20,676	9,638	30,314	6.4	24,359	1,791	782	24.0	438	26.5	9,869	143	43.1
Michigan Central 1926	13,143	17,867	31,010	5.0	26,327	1,888	704	20.6	447	34.1	7,553	106	69.0
1925	12,804	19,434	32,238	4.9	25,649	1,825	686	19.6	391	30.7	6,908	112	55.6
New York Central.....1926	57,373	78,774	136,147	4.0	27,331	2,365	1,046	26.6	533	31.2	11,189	109	57.1
1925	59,567	72,512	132,079	4.8	25,950	2,267	988	26.4	522	31.2	10,642	112	55.2
New York, Chic. & St. L.1926	10,705	11,782	22,487	6.5	23,450	1,742	688	20.9	677	46.7	9,143	103	77.7
1925	11,164	11,791	22,955	6.4	22,243	1,734	689	21.4	638	44.2	8,779	109	72.6
Pere Marquette 1926	8,989	12,913	21,902	3.6	16,847	1,484	646	25.2	471	28.6	4,737	105	75.5
1925	8,491	11,751	20,242	4.3	15,412	1,442	657	25.3	459	26.9	4,229	105	70.9
Pitts. & Lake Erie.....1926	10,287	9,668	19,955	6.5	28,772	2,794	1,643	44.6	366	12.4	31,592	97	55.4
1925	14,045	7,093	21,138	7.6	26,994	2,525	1,457	42.2	277	10.0	25,331	63	46.2
Wabash 1926	13,762	14,724	28,486	2.7	25,021	1,754	732	22.5	643	40.4	7,330	116	68.7
1925	12,903	12,456	25,359	3.0	23,831	1,762	741	22.5	674	41.9	6,845	120	63.8
Central Eastern Region:													
Baltimore & Ohio.....1926	64,179	41,169	105,348	3.9	19,648	1,992	980	32.0	638	31.0	12,942	154	70.2
1925	69,213	41,922	111,135	8.4	19,431	1,950	963	31.8	562	27.3	12,030	154	64.9
Central of New Jersey...1926	17,149	12,677	29,826	5.3	18,225	1,982	951	31.0	289	15.3	12,482	143	41.7
1925	17,374	11,132	28,506	4.5	13,602	1,501	698	27.5	204	11.5	8,420	183	37.8
Chicago & Eastern Ill....1926	12,037	5,287	17,324	24.2	22,578	1,773	835	28.2	424	23.0	7,768	119	52.4
1925	12,966	4,857	17,823	19.8	22,278	1,749	833	27.7	368	20.1	6,940	126	48.4
Clev., Cin., Chic. & St. L.1926	14,441	23,521	37,962	6.0	25,385	2,098	1,004	30.5	673	34.7	10,759	113	65.7
1925	15,424	21,171	36,595	5.5	24,967	2,087	1,002	30.6	684	35.2	10,519	113	63.9
Elgin, Joliet & Eastern...1926	9,069	6,917	15,986	5.5	15,871	2,220	1,190	40.1	314	11.8	10,923	124	50.4
1925	9,398	7,738	17,136	7.1	17,212	2,347	1,255	39.3	296	11.2	11,022	120	45.0
Long Island 1926	1,855	7,172	9,027	1.1	5,269	985	395	24.6	70	4.7	1,599	229	38.8
1925	1,848	5,510	7,358	0.9	4,886	812	310	23.9	67	4.8	1,256	243	39.8
Pennsylvania & System...1926	199,891	93,661	293,552	9.1	20,526	1,981	962	31.6	530	25.4	14,289	125	58.4
1925	204,468	91,660	296,128	10.7	20,374	1,938	929	31.1	473	23.3	12,874	122	51.9
Reading 1926	26,487	13,994	40,481	3.1	20,858	1,972	1,028	35.6	523	23.2	18,746	143	58.3
1925	22,221	16,083	38,304	2.8	20,881	1,806	911	33.9	462	22.2	15,634	150	49.3
Pocahontas Region:													
Chesapeake & Ohio.....1926	30,003	12,375	42,378	2.7	29,140	2,732	1,514	44.2	1,476	57.3	23,610	90	70.6
1925	28,241	11,650	39,891	3.4	25,585	2,537	1,372	42.7	1,388	57.1	21,067	100	74.1
Norfolk & Western.....1926	30,240	12,022	42,262	1.2	37,466	3,066	1,705	46.7	1,295	46.3	24,533	130	66.5
1925	27,301	10,009	37,310	2.7	34,683	2,823	1,546	45.3	1,241	45.0	20,757	133	58.7
Southern Region:													
Atlantic Coast Line.....1926	21,255	11,849	33,104	3.6	17,586	1,466	595	22.3	425	29.3	2,853	113	49.1
1925	18,818	16,899	35,717	4.1	16,647	1,418	595	23.0	449	29.1	3,271	115	64.6
Central of Georgia.....1926	8,784	7,103	11,887	6.5	17,031	1,329	596	24.1	556	32.0	3,468	141	66.4
1925	3,901	9,088	12,989	6.0	15,295	1,217	566	24.7	552	30.2	3,760	146	80.5
I. C. (inc. Y. & M. V.).1926	37,956	30,823	68,779	3.9	22,617	1,806	787	27.2	759	43.0	7,966	121	81.0
1925	40,093	30,474	70,567	4.5	21,696	1,775	788	26.9	723	40.5	7,781	122	75.5
Louisville & Nashville....1926	40,723	19,111	59,834	13.0	16,625	1,414	701	33.9	678	32.4	8,084	150	88.4
1925	38,324	20,026	58,350	14.7	15,596	1,314	646	33.2	684	33.6	7,940	153	98.2
Seaboard Air Line.....1926	12,497	9,030	21,527	3.1	16,704	1,466	626	23.5	491	31.1	2,707	129	60.8
1925	10,657	13,744	24,401	2.1	15,184	1,406	589	22.9	449	29.1	2,917	137	77.1
Southern Railway System.1926	51,472	27,917	79,389	5.3	18,121	1,392	589	23.1	493	31.1	4,865	149	55.0
1925	49,222	31,591	80,813	5.6	17,364	1,343	569	22.8	484	30.5	4,796	147	59.7
Northwestern Region:													
Chic. & North Western...1926	47,229	30,853	78,082	7.0	19,034	1,508	628	24.0	436	28.4	4,023	127	63.9
1925	48,294	29,896	78,190	10.1	18,484	1,478	598	23.1	405	26.5	3,746	124	59.1
Chic. Milw. & St. P....1926	53,291	26,599	79,890	6.4	21,096	1,724	735	24.8	543	34.5	3,883	129	63.8
1925	55,655	28,064	83,719	6.4	20,969	1,749	769	25.3	535	32.6	3,996	132	59.5
Chic., St. P., Minn. & Om.1926	3,002	8,925	11,927	11.6	14,116	1,151	484	22.8	431	27.9	2,984	126	62.2
1925	3,058	9,022	12,080	11.1	13,419	1,093	476	22.8	449	27.1	2,984	138	60.8
Great Northern 1926	42,234	22,079	64,313	5.7	27,144	2,400	1,110	30.3	658	36.2	5,203	114	58.4
1925	45,862	22,396	68,258	6.1	24,357	2,225	1,034	29.8	589	32.6	4,881	116	55.8
M., St. P. & S. Ste. M..1926	20,894	7,473	28,367	4.2	16,400	1,435	668	25.6	448	25.7	2,906	103	59.5
1925	20,668	9,074	29,742	4.1	16,435	1,431	684	27.1	562	31.7	3,822	102	74.2
Northern Pacific 1926	35,250	10,033	45,283	6.3	23,497	1,862	803	23.7	564	34.4	3,920	133	55.2
1925	36,311	11,340	47,651	6.5	22,376	1,826	833	25.9	620	34.1	4,531	125	59.3
Oreg.-Wash. R. R. & Nav.1926	7,846	5,590	13,436	3.8	20,430	1,772	821	27.0	479	24.9	2,979	168	55.4
1925	7,514	5,085	12,599	5.0	19,371	1,710	776	26.2	477	26.4	2,750	170	56.8
Central Western Region:													
Atch., Top. & S. Fe 1926	55,475	25,183	80,658	4.6	27,260	1,996	711	20.6	606	44.1	4,769	110	84.0
(incl. P. & S. F.).....1925	56,760	18,348	75,108	5.9	27,189	1,970	683	19.6	571	42.6	4,267	113	76.5
Chicago & Alton.....1926	9,080	5,977	15,057	6.1	18,085	1,500	587	22.8	451	30.6	6,639	154	83.1
1925	9,321	6,208	15,529	5.7	17,403	1,551	634	25.2	426	27.4	6,477	149	73.6
Chic., Burl. & Quincy....1926	45,935	23,120	69,055	5.2	22,755	1,806	797	25.9	642	39.8	4,743	129	60.6
1925	49,779	22,828	72,607	7.4	22,349	1,777	804	26.6	600	35.6	4,666	130	58.4
Chic., Rock I. & Pacific..1926	31,480	23,702	55,182	7.8	17,468	1,420	595	22.7	463	29.8	3,371	137	65.5
1925	32,590	22,832	55,422	10.6	17,620	1,404	581	22.8	471	31.0	3,451	142	66.3
Denver & R. G. Wn.....1926	10,695	6,737	17,432	3.7	16,395	1,553	655	23.8	436	26.7	2,954	192	58.4
1925	11,098	6,382	17,480	3.9	15,555	1,548	681	24.9	425	24.5	2,880	198	51.3
Oregon Short Line.....1926	7,886	5,923	13,809	4.7	22,582	1,750	708	23.6	658	41.7	3,579	123	70.3
1925	8,497	5,760	14,257	5.3	20,688	1,659	714	25.7	686	40.9	3,999	129	67.2
Sou. Pac.—Pac. Lines....1926	33,237	33,613	66,850	5.8	21,991	1,868	689	21.8	595	41.6	4,610	120	75.7
1925	31,669	37,351	69,020	5.8	20,165	1,859	714	22.8	608	41.0	4,934	127	81.2
Union Pacific 1926	20,220	12,090	32,310	10.3	37,370	2,096	723	19.4	1,137	86.8	9,947	108	103.3
1925	17,538	12,311	29,849	8.3	35,107	2,045	728	19.5	1,158	86.6	9,374	112	95.1
Southwestern Region:													
Gulf, Colo. & S. Fe.....1926	9,253	6,646	15,899	3.4	26,449	1,959	863	28.5	639	37.2	5,356	100	84.6
1925	8,304	5,033	13,337	3.7	23,737	1,774	742	24.3	504	32.2	3,559	102	65.9
Mo.-Kans.-Tex. 1926	8,109	4,773	12,882	4.5	26,887	2,082	810	21.7	544	39.5	3,922	91	72.8
1925	8,861	4,522	13,383	4.6	25,667	2,023	771	21.7	495	37.1	3,709	91	64.4
Mo.-Kans.-Tex. of Tex...1926	286	10,942	11,228	8.0	20,163	1,629	678	23.3	398	25.9	3,219	100	52.1
1925	276	10,598	10,874	9.7	18,526	1,545	578	20.9	325	25.4	2,545	105	44.4
Missouri Pacific 1926	26,133	24,573	50,706	5.5	20,813	1,651	709	24.5	683	41.6	4,755	122	80.7
1925	27,110	23,044	50,154	7.8	19,558	1,605	689	24.5	637	38.9	4,392	122	76.1
St. Louis-San Francisco..1926	19,404	13,707	33,111	4.2	18,052	1,457	601	24.0	505	32.6	2,413	144	58.5
1925	18,530	14,593	33,123	4.5	16,735	1,312	538	23.7	490	32.5	3,366	150	63.1
Southern Pacific Lines 1926	10,680	16,566	27,246	5.6	16,837	1,295	528	22.2	460	27.9	2,802	103	71.9
(in Tex. and La.)[1]....1925	9,958	16,570	26,528	7.3	17,360	1,308	545	23.3	494	31.7	2,961	112	75.2
Texas & Pacific.....1926	5,761	6,172	11,933	3.4	20,256	1,638	628	21.5	473	33.3	2,887	105	48.8
1925	5,909	8,164	14,073	5.6	17,729	1,486	586	22.4	450	31.2	3,240	113	58.0

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

General News Department

(*Continued from page* 1007)

eliminated and fundamentals only are taught, such as shock, hemorrhage, artificial respiration, mobilization of fractures and the proper ways to lift and carry injured persons.

According to present plans some 600 additional employees will begin a 10 weeks' course after the Christmas holidays.

International Congress of Refrigeration

An International Congress of Refrigeration will be held at Rome, Italy, on September 19 to October 1, 1927, under the auspices of the Italian government and the Institute International de Froid, which is a permanent body of the different governments that take membership direct. The United States is represented by the American Association of Ice and Refrigeration, of which J. F. Nickerson, Chicago, is secretary. The subjects to be considered at the meeting are divided into technical and commercial. Those under the former include the systematic selection and examination of various types of so-called refrigerator cars; the uniform classification of special cars for the transport of foodstuffs; the stowage and packing systems of goods in cars; the provisions and regulations for pre-cooling; technical instruction on the working and control of refrigerator cars; regulations to be followed in case of prolonged stoppage; provisions to be considered for railroad transport over various distances; and the creation of experimental stations for rolling stock. The commercial section includes a special itinerary for the rapid international transport of perishable produce; the selection of stations for reloading of cars with ice, salt, water, etc.; the obligations on the part of the consigner relative to the declarations, packing and preserving of goods; the establishment of bases for the enforcing of special operations necessary for the preservation of goods; and facilities to be accorded for the transport of packing ice and straw. Other questions to be considered include the means whereby goods can keep their mark of origin during international transport; adoption of a uniform method of inspection of refrigerated produce; examination of a special insurance scheme for easily perishable goods; and institution of international councils of arbitration to deal with litigation arising out of transport of perishable produce.

OPERATING REVENUES AND OPERATING EXPENSES OF CLASS I STEAM ROADS IN THE UNITED STATES

(For 186 Steam Roads, Including 13 Switching and Terminal Companies)

For the Month of September, 1926 and 1925

Item	United States		Eastern District		Pocahontas Region		Southern Region		Western District	
	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925
Average number of miles operated	237,049.02	236,593.54	59,352.33	59,493.90	5,554.34	5,544.47	39,046.96	38,719.58	133,095.39	132,835.59
Revenues:										
Freight	$444,141,942	$419,737,169	$189,112,923	$171,220,078	$22,923,776	$20,792,190	$55,767,598	$55,989,230	$176,338,545	$171,735,671
Passenger	a 92,647,979	b 95,710,201	48,614,590	48,216,493	1,919,071	2,045,522	11,606,632	13,818,456	30,507,686	31,629,730
Mail	7,552,030	7,684,732	2,911,783	2,933,784	191,901	196,504	1,116,395	1,107,051	3,331,951	3,447,393
Express	13,370,242	12,640,276	6,386,583	6,603,385	302,648	277,364	1,662,508	1,351,996	5,018,503	4,407,531
All other transportat'n	18,474,727	17,342,031	10,347,056	9,790,447	234,185	181,562	1,195,288	952,078	6,698,198	6,417,944
Incidental	12,992,287	11,734,036	6,334,654	5,593,220	487,576	326,232	1,273,944	1,287,962	4,896,113	4,526,622
Joint facility—Cr.	1,195,668	1,016,093	469,156	356,134	18,874	21,871	137,574	149,366	570,064	488,722
Joint facility—Dr.	414,283	296,230	144,125	d 12,014	2,102	3,708	33,550	35,264	234,496	269,272
Ry. operat'g revenues	589,960,592	565,568,308	264,031,710	244,725,555	26,075,929	23,837,537	72,726,389	74,620,875	227,126,564	222,384,341
Expenses:										
Maintenance of way and structures	78,532,688	76,743,783	34,768,578	32,736,856	3,658,866	3,980,382	11,231,695	10,628,771	28,873,549	29,397,774
Mainten'ce of equipm't	107,187,525	104,479,671	52,108,456	49,595,473	4,730,381	4,886,486	14,027,300	13,676,026	36,321,388	36,321,686
Traffic	9,605,269	8,952,356	3,646,181	3,301,806	258,921	234,741	1,658,374	1,573,208	4,041,793	3,842,601
Transportation	183,888,597	180,101,830	86,058,131	81,984,182	6,344,703	5,900,470	23,522,904	23,859,971	67,962,859	68,357,207
Miscellaneous operat'ns	5,000,721	4,697,985	2,295,316	2,024,006	85,444	89,317	485,304	540,562	2,134,657	2,044,100
General	15,096,720	14,340,392	6,816,985	6,374,476	513,212	456,775	1,996,983	1,882,279	5,775,540	5,626,862
Transportation for investment—Cr.	1,451,185	1,205,841	216,566	277,650	92,276	40,868	204,112	208,413	938,431	678,910
Ry. operat'g expenses	397,860,335	388,110,176	185,471,281	175,739,149	15,499,251	15,507,303	52,718,448	51,952,404	144,171,355	144,911,320
Net revenue from railway operations	192,100,257	177,458,132	78,560,429	68,986,406	10,576,678	8,330,234	20,007,941	22,668,471	82,955,209	77,473,021
Railway tax accruals	37,174,625	33,461,900	15,775,245	13,524,138	2,071,387	1,429,820	4,823,303	4,890,019	14,504,690	13,617,923
Uncollectible ry. rev's.	127,958	151,074	57,479	91,361	3,012	3,421	17,536	15,789	49,931	40,503
Ry. operating income	154,797,674	143,845,158	62,727,705	55,370,907	8,502,279	6,896,993	15,167,102	17,762,663	68,400,588	63,814,595
Equipm't rents—Dr. bal.	7,552,009	7,155,511	3,379,250	3,058,322	d 461,907	d 785,555	15,131	393,435	4,619,535	4,489,309
Joint facility rent—Dr. balance	1,753,674	2,167,962	768,300	1,035,330	112,350	82,274	58,777	106,761	814,247	943,597
Net railway operating income	45,491,991	134,521,685	58,580,155	51,277,255	8,851,836	7,600,274	15,093,194	17,262,467	62,966,806	58,381,689
Ratio of expenses to revenues (per cent)	67.44	68.62	70.25	71.81	59.44	65.05	72.49	69.62	63.48	65.16

For Nine Months Ended with September, 1926 and 1925

Item	United States		Eastern District		Pocahontas Region		Southern Region		Western District	
	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925
Average number of miles operated	236,973.20	236,617.23	59,413.95	59,545.59	5,548.93	5,539.80	38,927.93	38,706.92	133,082.39	132,824.92
Revenues:										
Freight	3,522,749,679	3,321,969,982	1,559,830,606	1,477,609,257	184,807,070	163,109,354	490,491,870	458,455,365	1,287,620,133	1,222,796,006
Passenger	c 794,029,308	e 796,671,294	398,335,951	395,090,776	16,724,584	17,363,424	117,224,252	114,949,364	261,744,521	269,267,730
Mail	70,383,140	71,219,894	26,749,397	27,295,242	1,840,193	1,854,630	10,593,281	10,236,291	31,200,269	31,833,721
Express	106,070,740	102,684,261	50,225,046	49,180,802	2,332,606	2,406,500	14,193,439	14,388,308	39,319,649	36,708,651
All other transportat'n	155,142,652	148,329,544	87,859,074	84,414,007	2,075,771	1,807,967	9,228,964	8,547,357	55,978,843	53,560,213
Incidental	99,632,007	93,489,084	49,669,243	45,743,036	3,855,965	3,083,990	11,824,204	10,871,965	34,282,595	33,790,093
Joint facility.—Cr.	9,931,420	7,832,256	3,986,508	3,246,014	131,640	148,023	1,276,290	1,226,330	4,536,982	3,211,889
Joint facility—Dr.	3,597,034	1,974,492	1,200,231	555,117	19,952	20,669	306,528	309,346	2,070,323	1,089,360
Ry. operat'g revenues	4,754,341,912	4,540,221,823	2,175,455,594	2,082,024,017	211,747,877	189,753,219	654,525,772	618,365,634	1,712,612,669	1,650,078,953
Expenses:										
Maintenance of way and structures	653,194,107	617,691,811	276,754,702	261,729,377	28,983,954	27,560,538	94,956,853	88,091,895	252,498,598	240,310,001
Mainten'ce of equipm't	962,719,397	945,539,227	464,749,191	454,693,019	43,905,173	44,499,866	126,756,707	119,619,222	327,308,326	326,727,120
Traffic	85,173,396	78,676,954	31,193,964	29,237,605	2,240,665	2,039,722	15,185,765	13,959,372	36,553,002	33,440,255
Transportation	1,622,740,013	1,596,672,902	767,047,645	750,319,721	55,297,231	52,498,121	225,989,600	212,914,948	574,405,537	580,940,112
Miscellaneous operat'ns	42,436,745	40,113,555	19,494,020	18,052,525	820,031	793,419	5,130,407	4,693,381	16,992,287	16,574,230
General	138,288,007	130,146,593	63,481,485	57,547,697	4,554,467	4,180,301	18,008,140	16,972,758	52,243,915	51,445,837
Transportation for investment—Cr.	11,919,782	9,134,934	1,477,300	1,469,265	440,452	477,715	2,225,400	1,636,512	7,776,630	5,551,442
Ry. operat'g expenses	3,492,631,883	3,399,706,108	1,621,243,707	1,570,110,679	135,361,069	131,094,252	483,802,672	454,615,064	1,252,225,035	1,243,886,113
Net revenue from railway operations	1,261,710,029	1,140,515,715	554,211,887	511,913,338	76,386,808	58,658,967	170,723,700	163,750,570	460,387,634	406,192,840
Railway tax accruals	292,020,005	265,828,145	122,043,664	110,807,474	15,182,351	11,482,953	39,851,418	36,654,918	114,942,572	106,882,800
Uncollectible ry. rev's.	1,189,575	1,307,440	581,013	644,816	28,721	46,163	145,020	165,759	434,821	450,702
Ry. operating income	968,500,449	873,380,130	431,587,210	400,461,048	61,175,736	47,129,851	130,727,262	126,929,893	345,010,241	298,859,338
Equipm't rents—Dr. bal.	61,282,059	57,198,017	33,324,497	31,581,569	d 5,271,118	d 4,862,842	9,128,221	6,101,494	24,100,459	24,377,796
Joint facility rent—Dr. balance	17,931,126	17,221,480	8,358,302	8,107,398	874,199	816,409	1,022,793	1,015,441	7,675,832	7,282,232
Net railway operating income	889,287,264	798,960,633	389,904,411	360,772,081	65,572,655	51,176,284	120,576,248	119,812,958	313,233,950	267,199,310
Ratio of expenses to revenues (per cent)	73.46	74.88	74.52	75.41	63.93	69.09	73.92	73.52	73.12	75.38

a Includes $3,734,380 sleeping and parlor car surcharge. b Includes $3,857,215 sleeping and parlor car surcharge. c Includes $31,575,699 sleeping and parlor car surcharge. d Deficit or other reverse item. e Includes $29,572,233 sleeping and parlor car surcharge.

"Central of Georgia Completes Great Construction Project"

The foregoing is the title of a statement widely published in local papers, by which President J. J. Pelley informs the public of how the road has been engaged for over two years in improving a part of its line. He says, in part:

"This month marks the completion of the reconstruction and grade revision of the Central of Georgia's line between Birmingham, Ala., and Columbus, Ga., 154½ miles, a work which has cost nearly seven million dollars. It is of importance to the traveling and shipping public and its accomplishment brings about improved service and reduced cost of operation. The new work has eliminated 40 highway grade crossings, thereby lessening the chances of injury to careless automobile drivers. Two railway grade crossings are done away with. The elimination of 89 curves insures easier and smoother operation. Schedules are more easily maintained and train movement is facilitated. Wooden trestles with a total length of 2,426 ft. were replaced by concrete and steel structures.

"There are also distinctive benefits for the shipping public. The industries served are farming, lumbering, manufacturing and mining. The line is a link in the route handling through traffic from the Birmingham and western territory to Savannah, and there is heavy coal traffic from Birmingham to the South and East.

"Such a huge sum as seven million dollars, the cost of the improvement, is not obtainable from current revenue, and the company borrowed the money, because the expenditure is justified by the economy and efficiency that will result. Each locomotive can haul approximately twice as many freight cars as under the former conditions. This lessens the consumption of coal and prevents a shortage of transportation. If the railroads are to be able to maintain current rate levels with adequate service they must also be able to raise capital in large sums. The continuance of efficiency depends upon the ability of the railroads to obtain funds for further expansion. The safeguarding of railway credit is therefore important to all."

Canadian Trainmen Voting on Acceptance of Wage Raise Refusal

Canadian trainmen are voting on the question of acceptance or rejection of the decision of the arbitration board to award them a wage increase on the so-called New York Central basis, in effect on most roads in the United States. A vote of rejection would empower their leaders to call a strike.

For ten years the wages paid in the United States have been the governing factor on Canadian railways. After the so-called McAdoo award (general order No. 27, U. S. R. A.) the wages of Canadian railway employees were increased by a corresponding amount. There were subsequent increases, all of which were reflected in Canada, and at least one wage reduction which, also, was made effective in the Dominion.

Now the time has come, in the opinion of the railway managements to break away from this common standard of wages and in this view they are supported by many industrial leaders.

This increase (about 6 per cent) was granted on most roads in the United States, including parts of the Canadian National which are located in the United States.

More than a year was consumed in negotiations between the unions and the management and when no progress could be made. the men applied in 1926 to the federal government for a board of arbitration. Under the Canadian statutes, strikes, or lockouts are illegal unless the parties to the dispute have first submitted their case to arbitration. They are not compelled to accept the finding of the majority of the board of arbitration, but at least they must give the general public an opportunity to find out what the dispute is about. This procedure has been carried through; the arbitration board after hearing the case, has decided against the men.

It now remains for the men to decide their course of action, and this seems not to be in doubt. A ballot is now being taken right across the Dominion. It will be completed on November 24. Before the board of arbitration the unions asked for a 6 per cent increase and, also, an additional large increase similar to that now being sought in the United States. They have, however, indicated that the 6 per cent increase would satisfy them at the present time.

Traffic News

The National Railways of Mexico have suspended direct Pullman service between Mexico City, Mex., and various Texas points, because of the present immigration laws.

The Chicago, Milwaukee & St. Paul on December 20, will establish through rates on wheat and flour from points in Montana to California by way of the Columbia basin and Portland, Ore., the rates to be in equality with those by way of Puget Sound.

The Chicago, Milwaukee & St. Paul, in conjunction with the Union Pacific, has reduced the running time of the Pacific Coast Limited between Chicago and San Francisco, Cal., three hours and forty-five minutes. The train now leaves Chicago at 2:30 p.m., instead of 10:45 a.m., and arrives in San Francisco at 8:30 a.m. the third day as previously.

The University of Maryland, co-operating with the Baltimore & Ohio, is running a special train with extensive dairy exhibits for the entertainment and instruction of farmers in a large number of towns scattered through eight counties of Maryland. The tour, beginning on November 15, takes in among other places, the cities of Oakland, Cumberland, Keedysville, Hagerstown, Rockville, Frederick, Sykesville, Aberdeen and Singerly.

The Commission has made public a proposed report by Examiner John T. Money recommending a finding by the commission that rates on Portland cement, in carloads, between points in southern territory, including the Mississippi Valley territory, and from points in trunk line and central territories to points in the southern states, are unreasonable and unduly prejudicial and recommending scales of rates and bases of rates to be prescribed for the future.

The Atchison, Topeka & Santa Fe, the Union Pacific and the Chicago, Rock Island & Pacific have entered into an agreement which is intended to meet motor bus competition by issuing interchangeable round-trip reduced rate tickets between Topeka, Kan., and Kansas City. Under this arrangement a passenger can use one road going and another road returning, on any train, at a rate of $3.50 for the round trip as compared with the old rate of $4.76. The tickets allow the holders three days after date of sale in which to return.

Grape Car Plan Criticised

A complaint against the operation of the California Grape Car Plan has been filed with the Interstate Commerce Commission on behalf of a number of grape-growers of the Fresno district, asking the commission to establish car service and car distribution rules to apply to the transportation of grapes between points in California and points in other states. The complaint is particularly directed against the feature of the plan by which shippers were asked to file estimates of their car requirements ten days in advance of each weekly period and given notice that in case of car shortage orders of shippers who had not filed such advance estimates would only be filled after the requirements of those who had filed had been met. The complaint says that the advance estimates must be only guesses and that it is impossible to make accurate estimates of car requirements more than 24 hours prior to loading.

Panama Canal Tolls Almost 23 Millions

The annual report of Governor Walker, of the Panama Canal, shows tolls collected in the fiscal year ending with June last, amounting to $22,931,055, the same having been collected from 5,197 ships. The number of vessels was increased 524 over the number registered in the preceding year and the tolls were recorded more than $1,500,000 greater.

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has announced the consolidation of its investigation of rates on petroleum and its products east of the Mississippi river and the Indiana-Illinois state line, No. 18,458, with its general rate structure investigation, No. 17,000, undertaken in response to the Hoch-Smith resolution. Accordingly No. 17,000, Rate Structure Investigation, Part 4, Petroleum and Petroleum Products, has been assigned for hearing with No. 18,458 at the times and places already designated or hereafter to be designated, insofar as the former relates to interstate rail rates coming within the scope of the investigation in No. 18,458.

State Commissions

The New York State Public Service Commission on November 12, announced 19 public hearings to be held on November 30, and December 1, 2 and 3, to consider certain crossing elimination problems. These crossing projects are located on the Rutland; the New York, Ontario & Western; the Delaware, Lackawanna & Western; the Pennsylvania; the New York Central and the Buffalo, Rochester & Pittsburgh. The hearings are to be held at Potsdam, Champlain, Malone, Hancock, Binghamton, Corning, Penn Yan and Rochester.

Court News

Construction of New York Statute as to Whistling and Ringing Bell at Crossing

The Circuit Court of Appeals, Third Circuit, summarizing the law of New York relating to duties at crossings, says that N. Y. Penal Law, section 1985, making failure to sound the whistle or ring the bell 80 rods from a crossing a misdemeanor, does not impose on railroads the duty of giving such warning. A railroad's duty is to give to persons on the highway some warning of an approaching train; what is sufficient warning is a question for the jury. "The law does not lay down any criterion other than that of due care in operating the train in all the circumstances. Failure to ring the bell or blow the whistle may, however, be evidence of negligence."—D. & H. v. Nahas, 14 F. (2d) 56.

Improper Whistling at Crossing, Frightening Horses

In an action for injuries to the occupant of a buggy struck by a train at a crossing, it appeared that the engineer, thinking the horse and buggy were about to cross the track, gave three or four short sharp blasts of the whistle, known as the stock alarm, when about 84 ft. from the horse, causing the animal to bolt across the track. The Kansas City Court of Appeals, affirming judgment for the plaintiff, said that the Missouri statute, Rev. St. 1919, section 9943, "does not unqualifiedly require the sounding of a whistle at any time when a train is approaching a crossing, but gives as an alternative the continuous ringing of the bell for 80 rods therefrom. Even where a whistle is sounded to comply with the statute, there is nothing in the statute requiring the giving of the stock alarm whistle, a whistle calculated to terrify animals, as the petition alleged was the case in this instance." The court drew the inference that the giving of the whistle under the circumstances was unnecessary and negligent. The bell had been continuously ringing since the train left the last station, some miles away. The court added: "Even if the engineer had been complying with the statute in sounding the whistle at intervals, there was no occasion for him to give the stock alarm whistle. It has been held that, even in sounding the whistle required by law, the engineer should do it in a proper manner, having due regard to the situation (Brown v. Mo. Pac., 89 Mo. App. 192, 195)."—Hyder v. Chicago, M. & St. P. (Mo. App.), 275 S. W. 977.

Equipment and Supplies

Locomotives

THE BOSTON & MAINE contemplates buying 25 Mikado type locomotives.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for 12, 2-10-4 type locomotives.

THE SEABOARD AIR LINE has ordered 25 six-wheel switching locomotives from the Baldwin Locomotive Works. Inquiry for this equipment was reported in the *Railway Age* of July 31.

THE DENVER & RIO GRANDE WESTERN is now inquiring for 10 Mallet type, 2-8-8-2 locomotives. In the *Railway Age* of November 13 this company was reported as contemplating the purchase of about 10 locomotives.

THE WESTERN MARYLAND has ordered 20 Decapod locomotives from the Baldwin Locomotive Works. In the *Railway Age* of November 6 it was reported that this company contemplated buying this equipment.

THE CENTRAL OF BRAZIL has ordered 10 three-cylinder Pacific type and three Mikado type locomotives from the Baldwin Locomotive Works. This is an additional order to the one placed with the same builder for 28 locomotives, as was reported in the *Railway Age* of October 2.

THE ATCHISON, TOPEKA & SANTA FE has ordered 15 Mountain type locomotives, 15 Santa Fe type, 10 Pacific type and one 4-8-4 type locomotive from the Baldwin Locomotive Works. The authorization for the purchase of 50 locomotives was reported in the *Railway Age* of November 13.

THE NEW YORK CENTRAL has ordered 70 locomotive tenders of 15,000-gal. capacity from the American Locomotive Company. Fifty of these are for service on the New York Central and 20 on the Pittsburgh & Lake Erie. Inquiry for this equipment was reported in the *Railway Age* of November 6.

Freight Cars

THE GREAT NORTHERN is asking for bids on 25 all steel tank cars.

THE NORTHERN PACIFIC is reported to have placed an order for 25 caboose car underframes with the Pacific Car & Foundry Company.

THE NORTHERN REFRIGERATOR CAR COMPANY, Milwaukee, Wis., has ordered 201 refrigerator cars from the Pullman Car & Manufacturing Corporation.

THE LONG ISLAND has ordered five caboose cars from the American Car & Foundry Company. The inquiry for these five caboose cars was reported in the *Railway Age* of October 9.

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for 1,000 box cars of 40 tons' capacity, 500 coal cars, 250 flat cars and 250 hopper ballast cars, of 50 tons' capacity, and 500 automobile cars of 40 tons' capacity.

THE CHICAGO & NORTH WESTERN will build 500 freight cars in its own shops, having divided an order for 500 steel underframes including the superstructures, equally between the General American Car Company and the Ryan Car Company.

THE CONLEY TANK CAR COMPANY has ordered 100 tank cars of 8,000-gal. capacity and 100 of 10,000-gal. capacity from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of November 6.

THE BUFFALO, ROCHESTER & PITTSBURGH, according to reports, will ask for prices on the repair of 850 wooden box and gondola cars. As reported in the *Railway Age* of November 13, this company recently placed orders for the repair of 1,000 steel cars.

Passenger Cars

THE ERIE is inquiring for 21 steel underframes for passenger cars.

THE PENNSYLVANIA has sent out inquiries for 60 multiple unit cars.

THE CHICAGO & NORTH WESTERN has ordered eight baggage cars from the Pullman Car & Manufacturing Corporation. Inquiry for this equipment was reported in the *Railway Age* of October 30.

Iron and Steel

THE PENNSYLVANIA is inquiring for 700 tons of steel for pole supports for electrification extension.

THE SOUTHERN is reported to have ordered 46,825 tons of rail from the Tennessee Coal, Iron & Railroad Company.

THE PENNSYLVANIA has ordered 200 tons of structural steel to be used at Bucyrus, Ohio, from the American Bridge Company.

THE LOUISVILLE & NASHVILLE has ordered 1,100 tons of structural steel from the McClintic-Marshall Company, 100 tons from the Bethlehem Steel Company and 100 tons from the Mt. Vernon Bridge Company.

THE SOUTHERN has ordered 10,000 tons of 130-lb. rail, 32,650 tons of 100-lb. rail and 4,175 tons of 85-lb. rail, from the Tennessee Coal, Iron & Railroad Company. These rails are for delivery during the first six months of 1927.

Machinery and Tools

THE CHICAGO, MILWAUKEE & ST. PAUL is inquiring for two motor-driven double end emery grinders.

THE MISSOURI PACIFIC has ordered one 25-ton locomotive crane from the American Hoist & Derrick Company.

THE CHICAGO & NORTH WESTERN has ordered one grinder from the Micro Machine Company. This machine is for use at Chicago.

THE NEW YORK CENTRAL has ordered one 28-ton locomotive crane from the Brown Hoisting Machinery Company, one 25-ton locomotive crane from the Ohio Locomotive Crane Company, two 25-ton locomotive cranes from the Industrial Works, and one ditcher from the American Hoist & Derrick Company. The New York Central has ordered two 27-in. by 16-ft. engine lathes; a dry grinding machine and a 20-in. vertical drill press, from the Niles-Bement-Pond Company.

Signaling

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company, an electro-mechanical interlocking for Conesville, Ohio, 12 electric units and ten mechanical.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the Union Switch & Signal Company, 29 semaphore signals, 164 relays and other material to be installed on its line near Amarillo, Tex.; 20 miles, double track.

THE ATLANTIC COAST LINE has ordered from the Union Switch & Signal Company, an electro-mechanical interlocking for Richland, Fla.; four electric levers and eight mechanical. The order includes seven semaphores.

Supply Trade News

The Graybar Electric Company has opened larger quarters for its Detroit, Mich., branch at 55 West Canfield street.

The Roto Company has removed its headquarters from Hartford, Conn., to Sussex avenue and Newark street, Newark, N. J.

The American Machinery & Equipment Company, Detroit, Mich., has moved its offices to 2532 Twenty-fourth street.

The Marion Steam Shovel Company, Marion, Ohio, has purchased a site in Kansas City, Mo., on which it will construct an assembly plant.

B. W. Parsons has been appointed sales representative at St. Paul, Minn., with office at 1010 Builders Exchange, for the **American Locomotive Company.**

Walter F. Brumm, assistant district sales manager of the **Inland Steel Company,** with headquarters at Kansas City, Mo., has been transferred to St. Louis.

Mefford R. Runyon has been appointed district sales manager for the New York Metropolitan district of the **Bridgeport Brass Company,** Bridgeport, Conn.

John H. Rodger, vice-president in charge of the Chicago office of the **Safety Car Heating & Lighting Company,** has been promoted to vice-president in charge of railway sales, with headquarters at New York. **George H. Scott,** representative at Chicago, has been promoted to manager of the Chicago office and **Carl A. Pinyerd,** for the past few years district engineer in the Chicago office, has been promoted to commercial engineer with the same headquarters. John H. Rodger began work in 1899 with the Standard Coupler Company, New York, leaving that service in 1905 to become assistant to the president of the Monarch Machine Company. He was then for a time engaged in other business and returned to the railway supply business in April, 1911, when he entered the service of the Safety Car Heating & Lighting Company, and was assigned to the Chicago office as a sales representative. Subsequently he served as acting vice-president and later as western manager until his appointment in June, 1922, as vice-president, with the same headquarters, which position he held until his recent promotion to vice-president in charge of railway sales, with headquarters at New York.

J. H. Rodger

The Pollack Steel Company, Cincinnati, Ohio, has opened a sales office at Detroit, Mich., in charge of **B. G. Lalman,** sales engineer, and **W. R. Klinkicht,** metallurgist.

George W. Denyven has been appointed New England representative for the **Tyler Tube & Pipe Company,** Washington, Pa. Mr. Denyven will have his headquarters at Boston, Mass. **W. H. S. Bateman & Co.,** Philadelphia, Pa., have been appointed special representatives.

L. E. Porter, who has been elected vice-president of **S. F. Bowser & Co., Inc.,** Fort Wayne, Ind., was born at Petoskey,

Mich., on October 2, 1880. He entered the employ of S. F. Bowser & Co., Inc., on January 11, 1909, and after working in various capacities in the Dallas, Texas, office, the St. Louis, Mo., office and on special sales work at Chicago, he was appointed district manager, with headquarters at St. Louis. On December 1, 1919, he was transferred as district sales manager to Detroit, Mich., which position he held until September 27, 1920, when he was appointed director of publicity at Fort Wayne, Ind. On August 1, 1922, he was appointed assistant general manager and on March 16, 1925, was appointed treasurer, which position he held until his recent promotion to vice-president in charge of industrial and engineering sales.

Obituary

Henry N. Winner, general manager of the Garlock Packing Company, Palmyra, N. Y., died suddenly on November 12 at Philadelphia, Pa., while on a vacation, at the age of 47.

B. E. Hamilton, assistant general manager of sales in charge of the bar bureau of the Illinois Steel Company, died in Chicago on November 11. He was born in Unionville, Conn., on April 9, 1862, and after representing various bolt and steel manufacturers in the east, he entered the employ of the American Steel Hoop Company in 1900, and in 1902, when this company was absorbed by the United States Steel Corporation he became associated with the Illinois Steel Company.

P. W. O'Brien, assistant general manager of sales in charge of the rail bureau of the Illinois Steel Company, Chicago, who died on November 9, of pneumonia, was born in 1860. He has been connected with the steel business during the past 40 years, having entered the employ of the Carnegie Steel Company on July 2, 1886. Since the formation of the United States Steel Corporation in 1901, he has been in charge of the rail bureau in the general offices of the Illinois Steel Company, as assistant general manager of sales.

Trade Publications

FIRE BRICK CEMENT.—The Botfield Refractories Company, 776 South Swanson street, Philadelphia, Pa., has issued bulletins descriptive of Adamant fire brick cement for furnace brickwork.

FLUSH VALVES.—Various flush valve models, including the Bridgeport-Keating foot control, are described in a circular entitled, "The Last Word in Sanitation," issued by the Bridgeport Brass Company, Bridgeport, Conn.

GRAPHIC METERS.—The Esterline-Angus quick trip graphic instrument for recording hydraulic pressures is described and illustrated in Bulletin No. 1026 issued by the Esterline-Angus Company, Indianapolis, Ind. The Esterline-Angus recording ammeter for use in radio telegraph stations is also described.

RAYMOND ROLLER MILLS.—Raymond roller mills and pulverizers, built especially for fine pulverizing and designed for use in connection with air separation, are described in detail in catalogue No. 18 issued by the Combustion Engineering Corporation, 43 Broad street, New York. The feed control of these mills is pneumatic in action. Movement takes place only in the opening and closing of two small valves in the controller and the collapsing and inflation of the diaphragm of the pawl-lifting mechanism.

WELDING STRUCTURAL STEEL.—The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a 31-page publication, S. P. 1767, on the arc welding of structural steel. The first part of this publication deals with the arc welded buildings of the Westinghouse company at East Pittsburgh. The succeeding sections describe the erection methods, the test and inspection of arc welds, the metallurgy of welding and the Westinghouse arc welding equipment. The testing of actual joints is discussed and a detail description of the results of the tests conducted at the Carnegie Institute of Technology given.

Railway Construction

BOSTON & ALBANY.—A contract has been let to the J. F. Fitzgerald Construction Company, Boston, Mass., for the construction of an enginehouse and layout at Worcester, Mass.

CHICAGO, MILWAUKEE & ST. PAUL.—This company contemplates immediate electrification of its line between Seattle, Wash., and Black River Junction, about 10 miles, at an approximate cost of $250,000.

CISCO & NORTHEASTERN.—This road has been authorized to construct an extension of its line from Breckenridge to Throckmorton, Tex., a distance of approximately 35 miles. The extension is intended to serve an area in Stephens and Throckmorton counties that is encircled, but not materially penetrated by railroads.

HOUSTON & SHREVEPORT.—This company contemplates the construction of a viaduct at Shreveport, La., to carry its line over tracks of the Kansas City Southern. It also plans the extension of the yard at the same point, both projects to involve an expenditure of about $335,600.

MISSOURI PACIFIC.—This road has been granted authority to construct an extension of a branch line, whose present terminus is Hot Springs, Ark., to a point 11.82 miles distant in a northwesterly direction. The extension is for the purpose of serving a lumber mill under construction.

MISSOURI PACIFIC.—A contract has been awarded to the Anton Beffa Contracting Company, St. Louis, Mo., for the wrecking of a group of buildings at St. Louis preparatory to the construction of a 25-story office building which is estimated to cost $1,500,000.

MUSCLE SHOALS, BIRMINGHAM & PENSACOLA.—Bids for the construction of the first unit of this line (a subsidiary of the St. Louis-San Francisco) from Aberdeen, Miss., to Aliceville, Ala., closed on October 30.

NATIONAL OF MEXICO.—Construction of a combined freight and passenger station at Tampico, Mex., is contemplated by this company.

NEW YORK CENTRAL.—An overhead structure to eliminate a grade crossing on the Dunes highway at Baileytown, Ind., is contemplated by this company in conjunction with the authorities of Porter county.

NEW YORK, NEW HAVEN & HARTFORD.—A contract has been awarded to the J. N. Leonard Company, New Haven, Conn., for alterations to and extension of the car repair shop at the Lamberton street yard, New Haven, Conn., estimated to cost $125,000. This company has also authorized the construction of an addition to the boiler room at Norwood Central, Mass., estimated to cost $27,800.

PENNSYLVANIA.—A contract has been let to Battey & Kipp, Inc., Chicago, for the construction and installation of smoke-washing equipment at the roundhouse at Garfield boulevard, Chicago, at a cost of about $250,000.

PENNSYLVANIA.—A contract has been awarded to Bentley Brothers Company, Cleveland, Ohio, for paving a driveway at the Woodland avenue freight station, Cleveland. A contract has also been awarded to the Hunter Construction Company, Youngstown, Ohio, for the erection of superstructure of a bridge at Centre street, Ashtabula, Ohio.

SOUTHERN KANSAS INDUSTRIAL BELT.—The Interstate Commerce Commission has denied the application of this company to construct a line of railroad extending from Fredonia, Kan., in a southeasterly direction, 3.858 miles, all in Wilson County, Kan. The proposed railroad would have connected at Fredonia with branch lines of the Atchison, Topeka & Santa Fe, the Missouri Pacific and the St. Louis-San Francisco.

TEXAS & PACIFIC.—Bids closed on November 9, for the construction of a two-story reinforced concrete and brick passenger station at Natchitoches, La., to cost about $50,000.

Railway Financial News

ATLANTIC COAST LINE.—*Acquisition of A. B. & A.*—See article on another page of this issue entitled "Acquisition of A. B. & A. by the A. C. L. Found To Be In Public Interest."

Acquisition of Columbia, Newberry & Laurens.—The Interstate Commerce Commission has approved an application by the Atlantic Coast Line to acquire control of the Columbia, Newberry & Laurens by purchase of its capital stock. The Coast Line has hitherto held a large interest in the smaller property and a considerable share of the other stock was held by friendly interests. The Columbia, Newberry & Laurens has a line from Columbia where a connection is made with the Atlantic Coast Line's line from Sumter, S. C., to Laurens where a connection is made with the Charleston & Western Carolina, an A. C. L. subsidiary. It was shown in the record that only 15 per cent of the traffic of the Columbia, Newberry & Laurens originates on its own line and that the larger part of its business is overhead traffic moved by the Atlantic Coast Line and the Charleston & Western Carolina. The commission expressed the view that the acquisition by the Atlantic Coast Line would be in keeping with the decision permitting the joint lease by the Coast Line and the Louisville & Nashville of the Clinchfield but it established a condition that the new owners must maintain the present neutrality in handling traffic and that the line of the carrier must be kept as an open route equally available to the Coast Line, the Seaboard Air Line and the Southern.

BALTIMORE & OHIO.—*Hopes to Be Able to Finance with Stock.*—At the annual meeting of the stockholders held at Baltimore, November 15, the stockholders ratified the acquisition of the stock of the Cincinnati, Indianapolis & Western, the Cheat Haven & Bruceton, and the Dayton & Union. The board of directors was re-elected. In connection with the financial position of the road, President Daniel Willard called attention to the fact that it had been the experience over a number of years that in order to keep the property simply abreast of the times, it was found necessary to expend for enlarged plant and additions to equipment, approximately $20,000,000 a year; that while there was something over $100,000,000 of refunding and general mortgage bonds to meet such requirements, it had seemed inadvisable at this time to add to the funded obligations of the company and that, therefore, in 1925 and 1926, after paying dividends, it had been the practice, except for refunding, to avoid increasing funded obligations other than equipment trusts, which are paid for over a limited number of years; further, that in 1925 there had been a surplus so applied of $10,000,000 and it was anticipated that after paying the dividends as declared for the current year there would be $12,000,000 or more that might also be so applied, and it was the hope and expectation that after paying dividends at the established rate, further applications of surplus for this purpose could be made, with the expectation that after an even more substantial surplus reserve had been built up in this manner, with continued satisfactory earnings, the necessary financing be accomplished by further extending the partnership through the medium of the sale of additional shares of stock, perhaps with an enlarged dividend basis.

CHICAGO, MILWAUKEE & ST. PAUL.—*Receivership Hearing.*—The hearing before the Interstate Commerce Commission into the receivership of the Chicago, Milwaukee & St. Paul was reopened at Chicago on November 15. Edwin C. Jameson, president of the Globe & Rutgers Fire Insurance Company, and chairman of the bondholders' defense committee, presented a statement in which he stated that the reorganization plan of Kuhn-Loeb & Co. and the National City Bank was unfair, that the receivership was unnecessary and was brought about by the bankers for the purpose of creating a new financial structure, and that the road could not regain prestige and financial strength until it found a man able to guide it better financially and a board of directors that was more directly interested and representative of stock holding. He told of his efforts to prevent the receivership and his offer to get an extension of maturing bonds. In this effort he said he talked with H. E. Byram, former president; Percy Rockefeller and Jerome Hanauer of Kuhn-Loeb & Co. "One principal objection to the present plan of reorganization," he said, "is that under it the present junior bondholders are deprived of $60,000,000 of lien, which is proposed to be placed ahead of their equity and given to the stockholders as a consideration for the money contributed to protect their stock. Furthermore, the junior bondholders are, by the terms of the plan, subjected to a possible assessment, by diversion of earned income to the rehabilitation of the road, for $25,000,000, which is greater by several millions of dollars than the market value of the maximum assessment imposed upon the stock. There are other serious objections to the plan, one of which is that it is sought to deprive the St. Paul junior lien bondholders of part of their equity for the benefit of holders of Puget Sound bonds, but the objection first stated above is of the greatest and most general interest to all citizens because, if by a combination of bankers and banking interests and stockholders, assisted by a selected group of bondholders, a plan of reorganization can be driven through which has such a result, then no lien of any railroad bond in this country has any real substance and this is a question which should be decided and made known at once."

Leroy J. Binkley, president of the Binkley Coal Company, testified that W. W. K. Sparrow, vice-president of the St. Paul, had asked him to sign the petition which threw the road into bankruptcy. He was told that the road desired to re-finance and that a receivership was necessary. A printed form of bankruptcy petition was ready for him to sign and he did so without question, following which, at the suggestion of Mr. Sparrow, he employed as counsel the firm of Winston, Strawn & Shaw, who later represented the road in the receivership proceedings.

Investigation—The Interstate Commerce Commission has announced a postponement to a date to be fixed hereafter of the oral argument in connection with its investigation of this company's affairs, heretofore set for December 9 and 10.

CHICAGO, PEORIA & ST. LOUIS.—*Sale.*—The Springfield-Lock Haven branch of the Chicago, Peoria & St. Louis was purchased by the Chicago, Springfield & St. Louis on November 12. The Chicago, Springfield & St. Louis is now endeavoring to raise money needed to provide working capital for this line and when the money is raised the line will be placed in operation.

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC.—*Extra Dividend.*—Directors, meeting at Cincinnati on November 15, following the annual meeting, declared a semi-annual dividend of 4 per cent and an extra dividend of 3 per cent on the common stock, payable December 21, 1926, to stockholders of record December 1, 1926. At the same time the regular quarterly dividend of 1¼ per cent was declared on the preferred stock payable December 1 to stockholders of record November 20. This company declared a stock dividend of 200 per cent last April.

DELAWARE, LACKAWANNA & WESTERN.—*Tentative Valuation.*—The Interstate Commerce Commission has served a tentative valuation report as of 1918 finding a final value for rate-making purposes of $95,217,200 for the property owned and $231,044,442 for the property used, including $136,230,942 for leased lines. The outstanding capitalization as of valuation date was $42,323,000, of which $42,220,400 was common stock and $102,600 funded debt. The investment in road and equipment as stated in the books was $75,297,494, which the report says should be readjusted to $72,559,998. Cost of reproduction new of the common-carrier property owned, exclusive of land, was placed at $104,458,911, and the cost of reproduction less depreciation at $77,913,610, while the cost of reproduction new of the used property was placed at $221,435,368 and the cost of reproduction less depreciation at $176,356,176. The company owned 5,434 acres of carrier land, assigned a present value of $7,249,518, and used 17,231 acres, assigned a present value of $40,209,777. It also had an investment in miscellaneous physical property of $109,431,447, of which, the report says, $105,773,518 represents the Lackawanna's estimate of the value of its unmined coal; and held securities of other companies of a par value of $40,596,917 and a book value of $41,362,108.

EDMONTON, DUNVEGAN & BRITISH COLUMBIA.—*Transfer to Province of Alberta.*—This railroad, the Central Canada and the Central Canada Express Company were formally transferred to the province of Alberta, Canada, on November 11. Premier

J. E. Brownlee at that time estimated the valuation of the Alberta government's railroad properties at $30,000,000 including the Edmonton, Dunvegan & British Columbia upon which he placed a valuation of $20,000,000. The latter railroad has been operated by the Canadian Pacific since July 20, 1921.

GREAT NORTHERN.—*Goes to Court About Guarantee Settlement.*—The Great Northern, on November 12, filed a complaint in the federal district court at St. Paul, Minn., seeking to set aside an order by the Interstate Commerce Commission holding that the Great Northern was overpaid by the government in connection with the six months' guarantee period following federal control. The railroad contends that instead of being overpaid $1,329,785, as contended by the commission, it has been underpaid and that no refund is due the government. According to the company a fair estimate for the particular six months in question would exceed half the full year's expenses by approximately $3,938,000 since the time in question covered the period of heaviest expenses.

HOCKING VALLEY.—*Tentative Valuation.*—The Interstate Commerce Commission has issued a tentative valuation report as of 1917 stating the final value for rate-making purposes of the property owned to be $32,310,421 and that of the property used to be $33,332,123, including $1,022,123 for leased lines. The outstanding capitalization as of valuation date was $36,351,393 and the book investment in road and equipment was $44,532,216, which the report readjusts to $37,546,966. The cost of reproduction new of the carrier property used exclusive of land was placed at $38,885,851 and the cost of reproduction less depreciation at $28,193,442.

ILLINOIS CENTRAL.—*Equipment Trust.*—Halsey, Stuart & Co. of Chicago, successful bidders for the Illinois Central 4½ per cent equipment trust certificates, series N, amounting to $4,665,000, have offered these securities for sale at prices to yield 4.40 per cent for the notes maturing October 1, 1927, 4.45 per cent for the notes maturing in 1928, 4.50 per cent for 1929, 4.55 per cent for 1930 and for the rest to 1941, 4.60 per cent.

INTERSTATE PUBLIC SERVICE COMPANY.—*Application of Section 15a.*—The Interstate Commerce Commission has issued a decision in which it holds that this company which is controlled by the Middle West Utilities Company and which includes in its operations an interurban line between Louisville, Ky., and Indianapolis, Ind., is not subject to section 15a of the Interstate Commerce Act.

MISSOURI PACIFIC.—*Control of New Orleans & Lower Coast.*—The Interstate Commerce Commission has approved the acquisition of the New Orleans & Lower Coast by purchase of all of the outstanding $300,000 capital stock which with $300,000 of first mortgage bonds will be purchased from the voting trustees. The property to be acquired extends from Buras, La., to Algiers, 59.7 miles. Algiers is on the west bank of the Mississippi opposite New Orleans. It is believed that the Missouri Pacific control of the property will permit a better railroad service for the agricultural and other products raised in the territory served.

Notes.—Kuhn, Loeb & Co. have offered $13,156,000 5¼ per cent secured serial bonds maturing in equal annual installments from December 1, 1931, to December 1, 1956, at 99½ giving an approximate yield of 5.30 per cent. The bonds will be secured by the deposit of $1,000 par value New Orleans, Texas & Mexico stock for each $1,000 principal amount in bonds and will be a direct obligation of the Missouri Pacific. The proceeds of the sale of bonds are to be applied to the retirement of $13,000,000 15-year 7 per cent sinking fund notes which have been called for redemption on January 17, 1927 and which were issued in connection with the purchase of the stock of New Orleans, Texas & Mexico and which had that stock as collateral.

NEW YORK CENTRAL.—*Lease of Subsidiaries.*—The Interstate Commerce Commission has assigned for hearing at Washington on December 7 the applications of the Cleveland, Cincinnati, Chicago & St. Louis for authority to acquire control by lease of the Cincinnati Northern and the Evansville, Indianapolis & Terre Haute and of the New York Central for authority to lease the Big Four, the Michigan Central and the Chicago, Kalamazoo & Saginaw.

PHILADELPHIA, BALTIMORE & WASHINGTON.—*Tentative Valuation.*—The Interstate Commerce Commission has issued a tentative valuation report on the property of this company, which owns the main line of the Pennsylvania system from Philadelphia to Washington, finding the final value for rate-making purposes as of 1918 to be $79,040,000. This is classified as property "owned but not used" by the P. B. & W., as it is leased to the Pennsylvania except property valued at $540,000 leased to the Philadelphia & Reading. The outstanding capitalization as of valuation date was $59,310,698 and the book investment in road and equipment was $92,839,709. With readjustments required by the accounting examination, the report says, this would be reduced to $57,045,319. The cost of reproduction new, exclusive of land, was placed at $78,707,312, and the cost of reproduction less depreciation at $64,299,247. The company also owned 6,058 acres of carrier lands, assigned a present value of $12,669,628. Property held for non-carrier purposes includes $11,527,779 par value and $10,206,114 book value of securities of other companies.

READING COMPANY.—*Lease of Lehigh and New England.*—See article on another page of this issue entitled "Approval of L. & N. E. Lease Recommended."

SOUTHERN.—*Stock Issue Authorized by I. C. C.*—The Interstate Commerce Commission has approved the application of the Southern to issue $10,000,000 of common stock. Stockholders met on November 18 to vote on the same question.

SPOKANE, PORTLAND & SEATTLE.—*Six Months' Guaranty.*—The Interstate Commerce Commission has issued a certificate to the Treasury stating that it has finally determined the amount of this company's guaranty for the six months' period following the termination of federal control of the railways as $345,726 and that the company had received $450,000 on certificates for advance and partial payments. The amount of the guaranty for the Oregon Electric Railway was fixed at $154,258 and the company had received $180,000, while the amount for the Oregon Trunk was certified as $80,000, of which it had received $40,000.

Average Price of Stocks and Bonds

	Nov. 16	Last Week	Last Year
Average price of 20 representative railway stocks	101.98	101.78	92.20
Average price of 20 representative railway bonds	96.78	96.33	92.63

Dividends Declared

Cincinnati, New Orleans & Texas Pacific.—Common, 3 per cent, extra; common, 4 per cent, semi-annually, both payable December 21 to holders of record December 1. Preferred, 1¼ per cent, quarterly, payable December 1 to holders of record November 20.

Consolidated Railroads of Cuba.—Preferred, 1½ per cent, quarterly, payable January 3 to holders of record December 10.

Cuba Railroad—Common, $1.20, quarterly, payable December 20 to holders of record December 20.

Pittsburgh, Youngstown & Ashtabula.—Preferred, 1¾ per cent, quarterly, payable December 1 to holders of record November 20.

Southern Pacific Company.—1½ per cent, quarterly, payable January 3 to holders of record November 26.

Union Pacific.—Common, 2½ per cent, quarterly, payable January 3 to holders of record December 1.

COALING PLANT.—Bulletin No. 85 descriptive of the Simplex patent automatic electric locomotive coaling plant, has been issued by the Roberts & Schaefer Company, Chicago. The actual operation of the Simplex loader filling skip with coal is clearly illustrated and a number of the skip hoist advantages enumerated. A recent installation on the Norfolk & Western at Portsmouth, Ohio, is also shown.

HYDRAULIC DREDGE MACHINERY AND PUMPS.—The Morris Machine Works, Baldwinsville, New York, has recently issued an informative and well illustrated 56-page catalog pertaining to its line of pumps, dredges and dredge equipment. The catalog also contains a discussion on hydraulic dredging, sand and gravel production, and the use of power equipment and accessories for this class of work.

Railway Officers

Executive

At a meeting of the board of directors of the South Georgia Railway held on October 7, the following officers were elected: **C. T. Tillman,** active vice-president; **R. C. McIntosh,** vice-president, and **C. F. Cater,** secretary. All will have headquarters at Quitman, Ga.

Ranson M. Calkins, formerly traffic manager of the Chicago, Milwaukee & St. Paul, who has returned after a leave of absence, has been appointed assistant to the receiver, with headquarters at Chicago in charge of industrial and agricultural development and other assigned duties.

Traffic

W. A. Gilmartin, city freight agent of the Chicago, Milwaukee & St. Paul, at New York City, has been appointed export and import agent, with the same headquarters.

N. G. Underwood has been appointed general agent of the transportation and traffic departments of the New York Central lines west of Buffalo, with headquarters at Cleveland, Ohio.

Henry E. Pierpont, acting chief traffic officer of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to chief traffic officer. He was born at Two Rivers, Wis., and entered railway service in May, 1883, as a telegraph operator on the Chicago, Milwaukee & St. Paul. He held various positions in the station and auditing departments, including that of freight agent at Kansas City, Mo., until May, 1892, when he was promoted to division freight and passenger agent at La Crosse, Wis. In January, 1896, he was again promoted to assistant general freight agent, with headquarters at Chicago, where he remained until January, 1907, when he was promoted to general freight agent, with the same headquarters. He was again promoted to freight traffic manager in January, 1913, and in August, 1918, he was appointed traffic manager. In April, 1926, he was appointed acting chief traffic officer, a position he held until his promotion to chief traffic officer.

H. E. Pierpont

S. J. Alton, traffic assistant to the vice-president of the Canadian National, with headquarters at Montreal, Que., has been appointed assistant to the general traffic manager, with the same headquarters.

M. J. Connelly, freight traffic representative on the New York, Chicago & St. Louis, with headquarters at Boston, Mass., has been promoted to New England freight agent, with the same headquarters, succeeding **E. H. Spangenberg,** promoted to eastern freight agent.

J. A. Wright, assistant foreign freight agent of the Canadian National, with headquarters at Montreal, Que., has been appointed foreign freight agent, with the same headquarters, succeeding **R. J. Foreman,** promoted. The position of assistant foreign freight agent at Montreal has been abolished.

J. A. K. Marmion has been appointed assistant general freight agent on the Southern Pacific, with headquarters at Houston, Tex., succeeding **J. C. Brasher,** retired under the pension rules of the company. **A. E. Weymouth** has been appointed general agent, with headquarters at Corpus Christi, Tex.

A. M. Levy, customs attorney on the Southern Pacific, with headquarters at Los Angeles, Cal., has been appointed assistant general freight agent, with headquarters at El Paso, Tex. He will be succeeded as customs attorney by **William H. Francis,** traveling freight and passenger agent, with headquarters at El Paso.

George Stephen, assistant freight traffic manager on the Canadian Pacific, with headquarters at Winnipeg, Man., has also been appointed freight traffic manager of the Kettle Valley. **H. A. Plow,** assistant general freight agent on the Canadian Pacific, with headquarters at Vancouver, B. C., has also been appointed general freight agent of the Kettle Valley. **N. R. Des Brisay,** general passenger agent on the Canadian Pacific, with headquarters at Vancouver, has also been appointed general passenger agent of the Kettle Valley.

L. Macdonald, assistant freight traffic manager of the Canadian National, with headquarters at Toronto, Ont., has been appointed freight traffic manager of the Central region, with headquarters at Montreal, Que., succeeding **Frank J. Watson,** who has been delegated to deal with freight traffic matters before the Board of Railway Commissioners for Canada. **R. W. Long,** general freight agent at Montreal, Que., has been appointed assistant freight traffic manager, with headquarters at Toronto, Ont., and **R. E. Perry** has been appointed general freight agent at Montreal, Que., succeeding Mr. Long.

R. J. Foreman, foreign freight agent of the Canadian National, with headquarters at Montreal, Que., has been appointed general foreign freight agent, with the same headquarters. Mr. Foreman was born on December 31, 1878, at Toronto, Ont., and was educated in the Public schools. He entered railway service in August, 1892, with the Grand Trunk (now a part of the Canadian National) at Toronto, Ont., and from that date until July 31, 1898, was clerk and stenographer in the superintendent's office. From December, 1898, to March, 1902, he was stenographer and chief clerk to the general freight and passenger agent of the Lake Erie & Detroit River (now a part of the Pere Marquette) at Walkerville, Ont. From the latter date until September, 1904, Mr. Foreman was chief clerk to the superintendent of the Buffalo division of the Pere Marquette at Walkerville, Ont., St. Thomas, Ont., and Detroit, Mich. He then became chief clerk to the chairman of the Canadian Freight Association at Toronto, Ont., and at Montreal, Que., which position he held until December, 1907. From January, 1908, until January, 1911, he was chief clerk to the assistant freight traffic manager, and also chief of the tariff bureau of the Grand Trunk Pacific (now also a part of the Canadian National) at Winnipeg, Man., and from the latter date until July, 1913, was assistant general freight agent of the same road at the same place. Mr. Foreman then became assistant to the vice-president of the Grand Trunk and the Grand Trunk Pacific at Montreal, Que., which position he held until July, 1920, when he became foreign freight agent of the Canadian National at Montreal. This position Mr. Foreman was holding at the time of his recent appointment as general foreign freight agent.

Operating

The item to the effect that **E. E. Wheeler** had been promoted to superintendent on the Southern Pacific is incorrect in that he has been transferred to the Tucson division as trainmaster, with headquarters at Phoenix, Ariz.

John Callaghan, general manager of the Alberta & Great Waterways and the Lacombe & North Western, with headquarters at Edmonton, Alta., has also been appointed general manager of the Edmonton, Dunvegan & British Columbia and the Central Canada.

George E. Goodship, assistant superintendent of the Detroit, Mich., terminals on the Michigan Central, who has been promoted to superintendent of the Detroit Yards and the Toledo division, with headquarters at West Detroit, Mich., was born on February 18, 1882, and after attending the Detroit public schools entered railway service on December 15, 1908, as a switchman on the Michigan Central. Two years later he was promoted to yardmaster and in March, 1916, he was again promoted to assistant general yardmaster. From April, 1918, to March, 1920, he served as trainmaster, with headquarters at Detroit, Mich., when he was promoted to assistant superintendent of terminals, with headquarters at West Detroit. He held the latter position until his promotion to superintendent of the Detroit Yards and the Toledo division, with the same headquarters.

G. E. Goodship

Edwin R. Anthony, who has been promoted to superintendent of the Coast division of the Southern Pacific, with headquarters at San Francisco, Cal., was born on November 27, 1860, at Sacramento, Cal., and after a grammar school education entered railway service in November, 1875, as a freight station messenger on the Central Pacific. From January, 1876, to July, 1897, he served as a clerk in the treasury department of the Central Pacific and was then transferred to the general auditor's department, being promoted in January, 1879, to cash keeper and bookkeeper in the general auditor's office. From August, 1880, to May, 1888, he was clerk in the paymaster's office and in May, 1888, he was promoted to assistant paymaster, holding the same position after the consolidation of the Central Pacific with the Southern Pacific in 1894, and remaining in that capacity until June, 1904, when he was transferred to the operating department as assistant division superintendent, with headquarters at San Francisco, a position he held until his promotion to division superintendent.

Edwin R. Anthony

Engineering, Maintenance of Way and Signaling

A. A. Matthews has been appointed chief engineer of the Denver & Salt Lake, with headquarters at Denver, Colo., succeeding **R. D. Stewart,** assigned to other duties because of ill health.

Dan C. Rounseville, assistant chief engineer of the Chicago & North Western, with headquarters at Chicago, retired on November 1 under the pension rules of the company. **F. W. Hillman,** engineer of the Wisconsin division, with headquarters at Chicago, has been assigned to other duties and has been replaced by **C. H. Perry,** engineer of the Ashland division, with headquarters at Antigo, Wis. **O. T. Husemeier,** assistant engineer of the Green Bay division, with headquarters at Green Bay, Wis., has been promoted to replace Mr. Perry. Mr. Rounseville was born on October 29, 1856, at Sheboygan Falls, Wis., and entered railway service on April 1, 1879, as a chainman on location on the Milwaukee, Lake Shore & Western (a subsidiary of the Chicago & North Western). From 1880 to 1884 he served as instrumentman and in the latter year he was promoted to assistant engineer, becoming division engineer on this road in 1893. Two years later he was appointed assistant engineer on the Chicago & North Western and in 1897 to division engineer. In 1906, he was appointed resident engineer on the construction of the Manitowoc, Green Bay & North Western (now a part of the Chicago & North Western). In 1907, he returned to the North Western as a division engineer and from 1909 to 1912 he was resident engineer on the construction of the Milwaukee, Sparta & North Western and from 1912 to 1914, resident engineer of the St. Louis, Peoria & North Western (both now parts of the Chicago & North Western). He was promoted to engineer of maintenance of the Chicago & North Western in 1914, and in 1918 he was made assistant to the chief engineer. In 1920, he was promoted to assistant chief engineer, a position he held until his retirement.

Purchases and Stores

C. B. Sauls, division storekeeper on the Illinois Central, with headquarters at McComb, Miss., has been appointed storekeeper of the Gulf & Ship Island in addition to his present jurisdiction, succeeding **G. B. Hopkins,** transferred to Gulfport, Miss.

Eugene A. Clifford, assistant general purchasing agent on the Atchison, Topeka & Santa Fe, with headquarters at Chicago, has resigned, effective December 1, and has been appointed general purchasing agent of the Chicago & North Western, with the same headquarters, succeeding **F. J. Berck,** appointed acting supervisor of standards, a newly created position.

E. J. Becker, general inspector of stores and supply train service on the Southern Pacific, with headquarters at San Francisco, Cal., has been promoted to traveling storekeeper, with the same headquarters, succeeding **J. E. Perry,** on leave of absence. **J. C. Neph,** assistant district storekeeper, with headquarters at El Paso, Tex., has been promoted to succeed Mr. Becker.

J. F. Newman, storekeeper of the Pennsylvania, with headquarters at Pitcairn, Pa., has been transferred to Pittsburgh, Pa., succeeding **W. C. Livingston,** who has been assigned to Mr. Newman's former place at Pitcairn. **W. W. Shugarts** has been appointed storekeeper at Altoona, Pa., succeeding **H. R. Wood,** relieved on account of illness, and **R. F. Homer** has been appointed acting assistant storekeeper at Altoona, Pa., succeeding Mr. Shugarts.

Obituary

Charles C. Chace, former auditor of the Chicago Junction and the Union Stock Yards & Transit Company, who retired from active railroad service in 1922 and died on November 9 at his home in Chicago, was born on August 30, 1858, at Port Jervis, N. Y., and entered railway service in 1876 as a cashier on the Lake Erie & Western, at LaFayette, Ind. In 1886, he was appointed agent for the same railroad at Findlay, Ohio, where he remained until 1891 when he resigned to become traffic manager of the G. H. Hammond Company, South Omaha, Neb., meat packers. The next year he was appointed auditor of the Chicago, Hammond & Western and in 1896 he was appointed auditor of the Chicago Junction (successor to the Chicago, Hammond & Western). In 1899, he was also appointed auditor of the Union Stock Yards & Transit Company and in 1920 he was elected vice-president of the Chicago River & Indiana, a position he held until his retirement from active service in 1922.